

The type of the variety was collected by Carl Friedrich Philipp von Martius (no. 561) on the campos at Boa Perna, Minas Gerais, Brazil, probably in 1818, and is deposited in the herbarium of the Botanical Museum at Munich.

*SYNGONANTHUS XERANTHEMOIDES* var. *MELANOLEPIS* (Alv. Silv.) Moldenke, comb. nov.

*Syngonanthus vernonioides* var. *melanolepis* Alv. Silv., Fl. Mont. 1: 396. 1928.

*SYNGONANTHUS XERANTHEMOIDES* var. *MINOR* (Kunth) Moldenke, comb. nov.

*Paepalanthus vernonioides* ♂ *minor* Kunth, Enum. Pl. 3: 529. 1841.

*SYNGONANTHUS XERANTHEMOIDES* var. *VERNONIOIDES* (Kunth) Moldenke, stat. & comb. nov.

*Paepalanthus vernonioides* Kunth, Enum. Pl. 3: 528. 1841.

*VERBENA PLATENSIS* f. *IVERIANA* (Bosse) Moldenke, comb. nov.

*Verbena teucrioides* f. *iveriana* Bosse ex Voss in Vilm., Blumen-gärt. 1: 827. 1895.

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#### ADDITIONAL NOTES ON THE ERIOCAULACEAE. XLVIII

Harold N. Moldenke

#### ERIOCAULACEAE Lindl.

Additional & emended bibliography: Wikstr., K. Vet. Acad. Handl. Stockh., ser. 2, 1: 73—81, pl. 3 & 4. 1820; Wikstr., *Trenne Nya Art. Örtsl. Erioc.* [7]—[15]. 1821; Mart., *Erioc. Selbst. Pflanzenfam.* [3], 4, 6, 11, 22, 24, 27, 29, 33, 38, 40, 41, 51, 55, 57, 58, 60, & 63, pl. 1 (I) fig. 1—6, 1 (II) fig. 7 & 8, pl. 2 (I) fig. 1—7, & pl. 2 (II) fig. 1—3. 1833; A. Rich., *Tent. Fl. Abyss.* 2: 347. 1851; Anon., *Journ. Linn. Soc. Lond. Bot.* 20: 522. 1884; Durand & Schinz, *Consp. Fl. Afr.* 5: 502—504. 1894; J. Jacks., *Fl. Worcester Co.*, ed. 2, 56. 1894; Engl., *Pflanzenw. Ost-Afr. C.* 133—134. 1895; Huber, *Bot. Mus. Para.* 2: 499—501. 1898; H. H. W. Pearson, *Journ. Linn. Soc. Lond. Bot.* 34: 304, 314, 320, 331, & 357. 1899; N. E. Br. in Thiselt.-Dyer, *Fl. Trop. Afr.* 8: 231—259, 261, & 262. 1901; Kirby, *Brit. Flow. Pl.* 147. 1906; Twining, *Fl. North-east. Penn.* 24. 1917; Malmanche, *Contrib. Étud. Anatom. Eriocaul.* [thesis]. 1919; Hand.-Mazz. in Engl., *Bot. Jahrb.* 56: 585. 1921; Frémy, *Bull. Soc. Linn. Normand.*, ser. 5, 7: 25—26. 1922; Limpr. in Fedde, *Repert. Beih.* 12: 314. 1922; Wangerin in Just, *Bot. Jahresber.* 51 (1): 168—171 [134—137]. 1923; Backer, *Handb. Fl. Java* 3: 5—8. 1924; Ridl., *Journ. Bot.* 63: Suppl. 126. 1925; Blewitt, *Fl. Waterbury* 39. 1926; Kräusel in Just, *Bot. Jahresber.*

48 (1): 244. 1926; O. C. Schmidt in Just, Bot. Jahresber. 52 (1): 156 [138]. 1927; Wangerin in Just, Bot. Jahresber. 49 (1): 160. 1927; Backer, Onkruidfl. 1: Handb. Suiker.-Cult. 7: 176—178 & 844, pl. 186—188. 1928; Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 60—61 [42—43]. 1928; M. A. Johnstone, Pl. Ecology 65—66 & 159. 1928; Wangerin in Just, Bot. Jahresber. 51 (1): 89 & 168—171 (1929), 50 (1): 231—232 & 317 (1930), and 53 (2): 261. 1930; Alston in Trimen, Handb. Fl. Ceylon 6: 303—306. 1931; Fedde in Just, Bot. Jahresber. 49 (2): 522—423 (1932) and 50 (1): 684. 1932; Rydb., Fl. Prairies & Plains, pr. 1, 198, 940, & 956, fig. 107. 1932; Fedde in Just, Bot. Jahresber. 51 (2): 295—296 (1933) and 52 (1): 786. 1934; Perrier de la Bâthie, Cat. Pl. Madagascar. 21—22. 1934; Dole, Fl. Vt., ed. 3, 78. 1937; Alston, Kandy Fl. xvi & 76. 1938; Pellegr., Mém. Soc. Linn. Normand. 26 [ser. 2, 1 (4)]: 58. 1938; Pellegr., Fl. Mayomb. 3: 58. 1938; Fedde & Schust. in Just, Bot. Jahresber. 60 (2): 29. 1940; Vester, Bot. Arch. 41: 346, fig. 126. 1940; Erdtman, Introd. Pollen Analys. 56, [57], & 236, pl. 1, fig. 10 & 11. 1943; León, Fl. Cuba 1: 278—284 & 426, fig. 112 & 113. 1946; P. R. Mill., Ind. Pl. Diseases U. S. 2: 327. 1950; Scoggan, Natl. Mus. Canada Bull. 115: 146. 1950; Anon., Taxon 1: 29. 1951; Metcalfe, Taxon 1: 130. 1951; Erdtman, Pollen Morph. & Pl. Tax., ed. 1, 163, 523, & 537, fig. 94A. 1952; Bond, Wild Fls. Ceylon Hills xiii & 232—233. 1953; Anon., Taxon 4: 68. 1955; Kramer, Taxon 4: 238. 1955; Moldenke in R. E. Schult., Bot. Mus. Leaflet. Harvard Univ. 17: 66. 1955; Ikuse, Pollen Grains Jap. 46. 1956; M. T. Davis, Taxon 6: [170], 179, & 181. 1957; Kramer, Taxon 6: 242. 1957; R. C. Foster, Contrib. Gray Herb. 184: 39. 1958; R. McVaugh, N. Y. State Mus. Bull. 360A: 93. 1958; Abeywickrama, Ceylon Journ. Sci. Biol. 2: 140—141. 1959; Hangulee, Das, & Datta, College Bot. 1: 841. 1959; Kramer, Taxon 8: 77. 1959; Rickett & Stafleu, Taxon 8: 232. 1959; Braga, Pl. Nordest., ed. 2, 20. 1960; K. Jones, Taxon 9: 183 & 187. 1960; Kramer, Taxon 9: 59. 1960; Beng, Leitfaden Pollenbest. 1: vi, 59, & 60, pl. 8, fig. 7—9 & text fig. 17 a & b. 1961; Van Steenis, Pacif. Pl. Areas 1: 103. 1963; Faegri & Iversen, Textb. Pollen Analys., ed. 2, pr. 1, 193 & 221. 1964; Takhtajan, Taxon 13: 163 & 164. 1964; Nair, Pollen Grains West. Himal. Pl. [Asia Monogr. 5:] viii, 35, 42, & 92, pl. 15, fig. 194. 1965; E. G. Voss, Mich. Bot. 4: 17, 22, & 23. 1965; Erdtman, Pollen Morph. & Pl. Tax., ed. 2, pr. 1, 163, 523, & 537, fig. 94A. 1966; Faegri & Iversen, Textb. Pollen Analys., ed. 2, pr. 2, 193 & 221. 1966; Nair, Es-sent. Palynol. 21, [23], [34], & 94, fig. 43. 1966; Stuckey, Mich. Bot. 5: 105. 1966; Airy Shaw in J. C. Willis, Dict. Flow. Pl., ed. 7, vii & lii. 1967; Friedrich-Holzhammer & Roessler in Merxmüller, Prodr. Fl. Südw. Afr. 15, 159: [1]—2. 1967; Kramer, Taxon 16: 58 & 211. 1967; C. E. Wood, Taxon 16: 27—28. 1967; Deb, Sengupta, & Malick, Bull. Bot. Soc. Bengal 22: 210. 1968; Gunawardena, Gen. & Sp. Pl. Zeyl. 206—207. 1968; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 1: 11, 16, & 20. 1969; Cronq., Taxon 18: 193. 1969; B. Hansen, Dansk Bot. Ark. 27: 29—33. 1969; Keng, Ord. & Fam. Malay. Seed Pl. 313—314, fig. 183. 1969; Kirpicznikov, Tax-

on 18: 698. 1969; Kramer, Taxon 18: 242. 1969; Quisumbing, Act. Manil. A.4 (9): 38. 1969; Sanchez Sanchez, Fl. Val. Mex., ed. 1, 77--78, fig. 38-B. 1969; Singer, Taxon 18: 309. 1969; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 2: xxxiii, xxxv, & xxxviii. 1970; Beard, West Austr. Pl., ed. 2, 25. 1970; Lowden, Taxon 19: 836 & 845. 1970; Matthew, Bull. Bot. Surv. India 12: 91. 1970; Nair, Pollen Morph. Angiosp. 61, 62, 70--72, 79, 83, 85, 123, & 155. 1970; Saxena, Bull. Bot. Surv. India 12: 62. 1970; Thaker, Sabnis, & Bedi, Bull. Bot. Surv. India 12: 125. 1970; Thanikaimoni, Inst. Franç. Pond. T., av. Sect. Scient. & Techn. 11: 185, [197], [199], [201], 243, & 283. 1970; Tomlinson & Sm., Taxon 19: 887. 1970; Venkatareddi, Bull. Bot. Surv. India 12: 220. 1970; Erdtman, Pollen Morph. & Pl. Tax., ed. 2, pr. 2, 163, 523, & 537, fig. 94A. 1971; Fonseka & Vinasithamby, Prov. List Local Names Flow. Pl. Ceylon 29 & 49. 1971; Hocking, Excerpt. Bot. A.18: 444 & 445. 1971; Kulkarni, Proc. 58th Ind. Sci. Cong. 3 (4): Abstr. 438. 1971; Rydb., Fl. Prairies & Plains, pr. 2, 1: 198, fig. 107 (1971) and pr. 2, 2: 940 & 956. 1971; Satake, Journ. Jap. Bot. 46: 109--111 [13--15], fig. 1 & 2, & 372--373 [20--21]. 1971; Thieret, Southw. Nat. 15: 391. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1155--1164 & Ind. 5, 7, 12, 16, 20--22, 28, & 29. 1972; Anon., Icon. Cormoph. Sin. 1: 979. 1972; Beadle, Evans, Carolin, & Tindale, Fl. Sydney Reg., ed. 2, 590, fig. 49. 1972; Bole, Excerpt. Bot. A.20: 83. 1972; C. A. Br., Wildfls. La. 11, 238, 240, & 243. 1972; Clifford & Ludlow, Keys Fam. & Gen. Queensl. Flow. Pl. 10, 56, 148, & 201. 1972; I. K. & L. F. Ferguson & Halliday, Watsonia 9: 59. 1972; Hamzah, Toha, & Van Steenis, Mount. Fl. Java 48, pl. 19, fig. 1 & 2. 1972; A. Hansen, Excerpt. Bot. A.19: 245. 1972; Hocking, Excerpt. Bot. A. 19: 364. 1972; Rouleau, Taxon Index Vols. 1--20 part 1: 139, 203, & 271. 1972; Sharma, Nucleus 15: Append. 10. 1972; R. R. Stewart in Nasir & Ali, Fl. West Pakist. Annot. Cat. 36 & 825. 1972; Thorne, Quart. Rev. Biol. 47: 370. 1972; Van dem Berghen, Nat. Belg. 53 (4): 157--169. 1972; Widder, Excerpt. Bot. A.19: 259. 1972; Natl. Acad. Sci. China, Iconogr. Sin. 1: 979. 1972; Alt-schul, Drugs & Foods 19 & 347. 1973; Anon., Biol. Abstr. 56 (1): B.A.S.I.C. S.88, S.184, S.253, & S.254 (1973), 56 (3): B.A.S.I.C. S.28, S.89, S.144, S.147, S.161, S.186, & S.258 (1973), 56 (6): B.A.S.I.C. S.30, S.89, S.144, S.147, & S.161 (1973), 56 (9): B.A. S.I.C. S.93 & S.199 (1973), 56 (10): B.A.S.I.C. S.91, S.147, S. 149, & S.265 (1973), and 56 (11): B.A.S.I.C. S.97. 1973; Birks, Past & Pres. Veg. Skye 40, 87, 152, 184, 213, & 218. 1973; Frohne & Jensen, System. Pflanzenr. 236, 263, & 290. 1973; C. D. K. Cook, Bull. Soc. Bot. Suisse 83: 55, 59, & 64. 1973; Harborne in L. P. Mill., Phytochemistry 2: 363. 1973; H. R., Biol. Abstr. 56: 5980. 1973; Kral, Rhodora 75: 382--384. 1973; M. D. S., Biol. Abstr. 56 (4): 1848. 1973; Moldenke, Biol. Abstr. 56: 69, 75, 1243, 1252, 1259, 1261, 3000, 3006, 3007, 5366, 5374, & 7484. 1973; Moldenke, Phytologia 26: 455--484, 500, 502--504, 506, 508, 509, & 511 (1973) and 27: 63--65 & 67--73, fig. 1--4. 1973; R. R. Rao, Stud. Flow. Pl. Mysore Dist. 2: 874--876 [thesis]. 1973; Robi-

chaud & Buell, Veg. N. J. 217, 319, & 327. 1973; Rogerson, Bull. Torrey Bot. Club 100: 192, 246, & 326. 1973; Ross-Craig, Drawings Brit. Pl. 31: pl. 46. 1973; Shetler & Read, Fl. N. Am. Rep. 71: 29. 1973; W. Stone, Fl. South. N. J., pr. 2, 323—325 & 817, pl. 28, fig. 1 & 2, & pl. 64, fig. 2. 1973; Thorne in Meggers, Ayensu, & Duckworth, Trop. For. Ecosyst. Afr. & S. Am. 29, 30, 33, & 36. 1973; Wedge, Pl. Names 18. 1973; Anon., Biol. Abstr. 57 (2): B.A.S.I.C. E.94 (1974) and 57 (4): B.A.S.I.C. E.95. 1974; Asher, Guide Bot. Period. 1 (8): 48. 1974; Hocking, Excerpt. Bot. A.23: 290—293. 1974; Howes, Dict. Useful Pl. 86. 1974; Moldenke, Biol. Abstr. 57: 678, 679, & 1905. 1974; Moldenke, Phytologia 27: 444, 508—510, & 512 (1974) and 28: 192—194, 401, 403, 426—430, 432, 435—448, 456, 457, 459—461, 463, 466, 467, 507—510, & 512. 1974; H. R., Biol. Abstr. 57: 5680. 1974; Rodriguez M., Mem. II Congres. Venez. Bot. 95. 1974; Rogerson & Becker, Bull. Torrey Bot. Club 101: 46. 1974; Traub, Pl. Life 30: 143. 1974; Vogelenzang, Asher's Guide Bot. Period. 1 (5): 75 & 95. 1974; Wedge, Pl. Names, ed. 2, 24 & 26. 1974.

The Kürnicke (1856) reference which occurs so often in the bibliography of this family is often cited as "1854", the title-page date, but pages 129—799 were actually not published until April of 1856. The Durand & Schinz (1894) item is often cited as "1895", the title-page date, but pages 465 to the end were actually published in 1894.

Angely (1969) accepts as valid a "Sub-series Eriocaulinales". Harborne (1973) reports for the Eriocaulaceae, as a family, the "general overall flavonoid pattern based on frequency of occurrence" 6- or 8-hydroxyflavonols and the specific family constituents of quercetagenin and patuletin.

Pearson (1899) speaks of the Eriocaulaceae as they occur in the characteristic patana grasslands of Ceylon (Sri Lanka), noting that they become very abundant at about 5000 feet altitude, especially in swampy (marshy) places, that they, along with peat-mosses, sedges, and grasses, accumulate and provide humus in the hollows with blocked drainage, and that they, the sedges, grasses, and Hedyotis verticillaris provide abundant fibrous remains of dead vegetative parts which persist and retain water. My wife and I can attest to the truth of these observations, since we observed the identical situation on the Horton Plains earlier this year in intimate detail.

It is of interest to note that Thwaites (1839), famous early worker on the Ceylonese flora, classified the pipeworts in the family Restiaceae. In this, of course, he was not alone among early systematists.

#### BLASTOCAULON Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 75 & 203. 1949; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1156 & Ind. 5. 1970; Anon., Biol. Abstr. 56 (3): B.A.S.I.C. S.23, S.89, & S.144 (1973) and 56 (6): B.A.S.I.C. S.30. 1973; Moldenke, Biol. Abstr. 56: 1259, 1261, &

3007. 1973; Moldenke, *Phytologia* 26: 455 & 500. 1973; Anon., *Biol. Abstr.* 57 (2): B.A.S.I.C. E.94. 1974; Hocking, *Excerpt. Bot. A.23*: 293. 1974.

**BLASTOCAULON ALBIDUM** (G. Gardn.) Ruhl.

Additional bibliography: Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 75 & 203. 1949; Moldenke, *Phytologia* 26: 16. 1973.

**BLASTOCAULON PROSTRATUM** (Körn.) Ruhl.

Additional bibliography: Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 75 & 203. 1949; Moldenke, *Phytologia* 24: 336. 1972.

**BLASTOCAULON RUPESTRE** (G. Gardn.) Ruhl.

Additional bibliography: Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 75 & 203. 1949; Moldenke, *Phytologia* 26: 455. 1973; Hocking, *Excerpt. Bot. A.23*: 293. 1974.

**BLASTOCAULON SPELEICOLA** Alv. Silv.

Additional bibliography: Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 75 & 203. 1949; Moldenke, *Phytologia* 26: 16. 1973.

**CARPTOTEPALA** Moldenke

Synonymy: *Carptopetala* Moldenke ex Hocking, *Excerpt. Bot. A.23*: 293, sphalm. 1974.

Additional bibliography: Anon., *Biol. Abstr.* 56 (1): B.A.S.I.C. S.88 (1973) and 56 (3): B.A.S.I.C. S.28 & S.89. 1973; Moldenke, *Biol. Abstr.* 56: 75 & 1259. 1973; Moldenke, *Phytologia* 25: 246 & 504 (1973) and 28: 454 & 507. 1974; Hocking, *Excerpt. Bot. A.23*: 293. 1974.

**CARPTOTEPALA JENMANI** (Gleason) Moldenke

Additional synonymy: *Carptopetala jenmani* (Gleason) Moldenke ex Hocking, *Excerpt. Bot. A.23*: 293, sphalm. 1974.

Additional bibliography: Moldenke, *Phytologia* 25: 246 (1973) and 28: 454. 1974; Hocking, *Excerpt. Bot. A.23*: 293. 1974.

Additional citations: GUYANA: *Jerman 1032* [N. Y. Bot. Gard. type photo 5007] (W—photo of type).

**COMANTHERA** L. B. Sm.

Additional bibliography: Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 66 & 203. 1949; Angely, *Fl. Anal. & Fitogeogr. Est. S. Paulo*, ed. 1, 6: 1156 & Ind. 7. 1970; Anon., *Biol. Abstr.* 56 (1): B.A.S.I.C. S.88 (1973), 56 (3): B.A.S.I.C. S.28 & S.89 (1973), and 56 (6): B.A.S.I.C. S.30 & S.161. 1973; Moldenke, *Biol. Abstr.* 56: 75, 1259, & 3007. 1973; Moldenke, *Phytologia* 26: 16 & 502. 1973; Hocking, *Excerpt. Bot. A.23*: 293. 1974.

**COMANTHERA KEGELIANA** (Körn.) Moldenke

Additional bibliography: Moldenke, *Phytologia* 26: 16. 1973; Hocking, *Excerpt. Bot. A.23*: 293. 1974.

Additional citations: GUYANA: *Linder 40* [N. Y. Bot. Gard. type

photo 5006] (W--photo).

**ERIOCAULON Gron.**

Additional synonymy: Eriocaulon trimerium Mart., *Erioc. Selbst.* Pflanzenfam. 55. 1833.

Additional & emended bibliography: Wikstr., K. Vet. Acad. Handl. Stockh., ser. 2, 1: 73--81, pl. 3 & 4. 1820; Wikstr., *Trenne Nya Art. Örtsl. Erioc.* [7]--[15] (repr.). 1821; Mart., *Erioc. Selbst.* Pflanzenfam. [3], 4, 6, 11, 22, 24, 27, 29, 33, 38, 40, 41, 51, 55, 57, 58, 60, & 63, pl. 1 (I) fig. 1--6, 1 (II) fig. 7 & 8, pl. 2 (I) fig. 1--7, & pl. 2 (II) fig. 1--6. 1833; A. Rich., *Tent. Fl. Abyss.* 2: 347. 1851; Anon., *Journ. Linn. Soc. Lond. Bot.* 20: 522. 1884; Durand & Schinz, *Consp. Fl. Afr.* 5: 502--504. 1894; J. Jacks., *Fl. Worcester Co.*, ed. 2, 56. 1894; Engl., *Pflanzenw. Ost-Afr. C.* 133--134. 1895; H. H. W. Pearson, *Journ. Linn. Soc. Lond. Bot.* 34: 304, 314, 320, 331, & 357. 1899; N. E. Br. in *Thiselt.-Dyer, Fl. Trop. Afr.* 8: 231--259, 261, & 262. 1901; Kirby, *Brit. Flow. Pl.* 147. 1906; Twining, *Fl. Northeast. Penn.* 24. 1917; Malmanche, *Contrib. Étud. Anatom. Eriocaul.* [thesis] 159. 1919; Hand.-Mazz. in Engl., *Bot. Jahrb.* 56: 585. 1921; Frémy, *Bull. Soc. Linn. Normand.*, ser. 5, 7: 25--26. 1922; Limpr. in *Fedde, Repert. Beih.* 12: 314. 1922; Wangerin in *Just, Bot. Jahresber.* 51 (1): 168--171 [134--137]. 1923; Backer, *Handb. Fl. Java* 3: 5--8. 1924; Ridl., *Journ. Bot.* 63: Suppl. 126. 1925; Blewitt, *Fl. Waterbury* 39. 1926; Kräusel in *Just, Bot. Jahresber.* 48 (1): 244. 1926; O. C. Schmidt in *Just, Bot. Jahresber.* 52 (1): 156 [138]. 1927; Wangerin in *Just, Bot. Jahresber.* 49 (1): 160. 1927; Backer, *Onkruidfl.* 1: *Handb. Suiker.-Cult.* 7: 176--178 & 844, pl. 186--188. 1928; Fedde & Schust. in *Just, Bot. Jahresber.* 53 (1): 60--61 [42--43]. 1928; M. A. Johnstone, *Pl. Ecology* 65--66 & 159. 1928; Wangerin in *Just, Bot. Jahresber.* 51 (1): 89 & 168--171 (1929), 50 (1): 231--232 & 317 (1930), and 53 (2): 261. 1930; Alston in *Trimen, Handb. Fl. Ceylon* 6: 303--306. 1931; Fedde in *Just, Bot. Jahresber.* 49 (2): 423 (1932) and 50 (1): 684. 1932; Rydb., *Fl. Prairies & Plains*, pr. 1, 198, 940, & 956, fig. 107. 1932; Fedde in *Just, Bot. Jahresber.* 51 (2): 295--296 (1933) and 52 (1): 786. 1934; Perrier de la Bâthie, *Cat. Pl. Madag.* 21--22. 1934; Dole, *Fl. Vt.*, ed. 3, 78. 1937; Alston, *Kandy Fl.* 76. 1938; Fedde & Schust. in *Just, Bot. Jahresber.* 60 (2): 29. 1940; Erdtman, *Introd. Pollen Analys.* 56, [57], & 236, pl. 1, fig. 10 & 11. 1943; León, *Fl. Cub.* 1: 279--281 & 426, fig. 112. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.* [ed. 2], 2--12, 14, 15, 18, 20, 22, 27, 30, 35--37, 39, 43--45, 57, 60, 63, 66--69, 72, 76, 77, 96, 98, 100, 103, 107--127, 129, 130, 132--146, 149--153, 155, 166, 203--207, & 214. 1949; P. R. Mill., *Ind. Pl. Diseases U. S.* 2: 327. 1950; Scoggan, *Natl. Mus. Canada Bull.* 115: 146. 1950; Erdtman, *Pollen Morph. & Pl. Tax.*, ed. 1, 163 & 523, fig. 94A. 1952; Bond, *Wild Fls. Ceylon Hills* xiii & 232--233. 1953; Ikuse, *Pollen Grains Jap.* 46. 1956; R. C. Foster, *Cobtrib. Gray Herb.* 184: 39. 1958; R. McVaugh, *N. Y. State Mus. Bull.* 360A: 93. 1958; Bullock, *Taxon* 7: 15 (1958) and 8: 171. 1959; Abeywickrama, *Ceylon Journ. Sci.*

- Biol. 2: 140—141. 1959; Gangulee, Das, & Datta, College Bot. 1: 841. 1959; K. Jones, Taxon 9: 183 & 187. 1960; Beug, Leitfaden Pollenbest. 1: vi, 59, & 60, pl. 8, fig. 7—9, & text fig. 17a & b. 1961; Faegri & Iversen, Textb. Pollen Analys., ed. 2, pr. 1, 193 & 221. 1964; Nair, Pollen Grains West. Himal. Fl. [Asia Monogr. 5:] viii, 35, 42, & 92, pl. 15, fig. 194. 1965; E. G. Voss, Mich. Bot. 4: 17, 22, & 23. 1965; Erdtman, Pollen Morph. & Pl. Tax., ed. 2, pr. 1, 163 & 523, fig. 94A. 1966; Faegri & Iversen, Textb. Pollen Analys., ed. 2, pr. 2, 193 & 221. 1966; Nair, Essent. Palynol. [23], fig. 43. 1966; Stuckey, Mich. Bot. 5: 105. 1966; Friedrich-Holzhammer & Roessler in Merxmüller, Prodr. Fl. Südw. Afr. 15, 159: [1]—2. 1967; Deb, Sengupta, & Malick, Bull. Bot. Soc. Bengal 22: 210. 1968; Gunawardena, Gen. & Sp. Pl. Zeyl. 206—207. 1968; B. Hansen, Dansk Bot. Ark. 27: 29—33. 1969; Quisumbing, Act. Manil. A.4 (9): 38. 1969; Sanchez Sanchez, Fl. Val. Mex., ed. 1, 77—78, fig. 38-B. 1969; Beard, West Austr. Fl., ed. 2, 25. 1970; Hocking, Excerpt. Bot. A.16: 38—40. 1970; Matthew, Bull. Bot. Surv. India 12: 91. 1970; Saxena, Bull. Bot. Surv. India 12: 62. 1970; Thaker, Sabnis, & Bedi, Bull. Bot. Surv. India 12: 125. 1970; Thanikaionni, Inst. Franç. Pond. Trav. Sect. Scient. & Techn. 11: 185 & 283. 1970; Venkatareddi, Bull. Bot. Surv. India 12: 220. 1970; Erdtman, Pollen Morph. & Pl. Tax., ed. 2, pr. 2, 163 & 523, fig. 94A. 1971; Fonseka & Vinasithamby, Prov. List Local Names Flow. Pl. Ceylon 29 & 49. 1971; Hocking, Excerpt. Bot. A.18: 444 & 445. 1971; Kulkarni, Proc. 58th Ind. Sci. Cong. 3 (4): Abstr. 438. 1971; Rydb., Fl. Prairies & Plains, pr. 2, 1: 198, fig. 107 (1971) and pr. 2, 2: 940 & 956. 1971; Satake, Journ. Jap. Bot. 46: 109—111 [13—15], fig. 1 & 2, & 372—373 [20—21]. 1971; Thieret, Southwest. Nat. 15: 391. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1156—1161 & 1163, maps 1775 & 1776, & Ind. 12. 1972; Anon., Icon. Cormoph. Sin. 1: 979. 1972; Bole, Excerpt. Bot. A.20: 83. 1972; C. A. Br., Wildfls. La. 11, 238, 240, & 243. 1972; Cliford & Ludlow, Keys Fam. & Gen. Queensl. Flow. Pl. 148 & 201. 1972; I. K. & L. F. Ferguson & Halliday, Watsonia 9: 59. 1972; Hamzah, Toha, & Van Steenis, Mount. Fl. Java 48, pl. 19, fig. 1 & 2. 1972; A. Hansen, Excerpt. Bot. A.19: 245. 1972; Hocking, Excerpt. Bot. A.19: 364. 1972; Sharma, Nucleus 15: Append. 10. 1972; R. R. Stewart in Nasir & Ali, Fl. West Pakist. Annot. Cat. 36 & 825. 1972; Thorne, Quart. Rev. Biol. 47: 370. 1972; Van den Berghen, Nat. Belg. 53 (4): 157—169. 1972; Widder, Excerpt. Bot. A.19: 259. 1972; Altschul, Drugs & Foods 19 & 352. 1973; Birks, Past & Pres. Veg. Skye 40, 87, 152, 184, 213, & 218. 1973; Anon., Biol. Abstr. 56 (1): B.A.S.I.C. S.88 (1973), 56 (3): B.A.S.I.C. S.28, S.39, & S.144 (1973), 56 (6): B.A.S.I.C. S.88, S.144, S.147, S.190, & S.256 (1973), and 56 (10): B.A.S.I.C. S.91, S.147, & S. 149. 1973; C. D. K. Cook, Bull. Soc. Bot. Suisse 83: 55, 59, & 64. 1973; R. Kral, Rhodora 75: 382—384. 1973; M. D. S., Biol. Abstr. 56 (4): 1848. 1973; Moldenke, Biol. Abstr. 56: 75, 1259, 1261, 3000, 3006, 3007, & 5374. 1973; Moldenke, Phytologia 26: 455—466, 471, 473—476, 479, & 503 (1973) and 27: 63—65 & 67,

fig. 1. 1973; R. R. Rao, Stud. Flow. Pl. Mysore Dist. 2: 874—876 [thesis]. 1973; Robichaud & Buell, Veg. N. J. 217, 319, & 327. 1973; Ross-Craig, Drawings Brit. Fl. 31: pl. 46. 1973; W. Stone, Fl. South. N. J., pr. 2, 323—325 & 817, pl. 28, fig. 1 & 2, & pl. 64, fig. 2. 1973; Asher, Guide Bot. Period. 1 (8): 48. 1974; Hocking, Excerpt. Bot. A.23: 290, 292, & 293. 1974; Howes, Dict. Useful Pl. 86. 1974; Moldenke, Biol. Abstr. 57: 678. 1974; Moldenke, Phytologia 27: 444 & 508 (1974) and 28: 101, 192, 401, 426—430, 435, 438, 442—448, 456, 457, 460, 466, 508, & 509. 1974; H. R., Biol. Abstr. 57: 5680. 1974.

The Eriocaulon trimerium of Martius (1833) is apparently a name he proposed to use to designate all the trimerous species of the genus as a group.

Gunawardena (1968) reminds us that the generic name, Eriocaulon, is derived from the Greek, erion, meaning wool, and kaulos, meaning stem, from the woolly scapes (peduncles) of some species.

Gangulee and his associates (1959) assert that Eriocaulon may be used as an indicator that Drosera is probably present in the neighborhood. I doubt if this rule holds throughout the considerable geographic range of the genus!

Alston (1931) provides an interesting key to the Ceylonese taxa of this genus known to him at that time [the nomenclature has been brought up-to-date]:

1. Plants entirely submerged; leaves linear; heads to 1/4 inch in diameter.
  2. Stems 1—3 feet long, leafy throughout; leaves 1—3 inches long.
    3. Receptacular bracts hairy; heads gray or white; pistillate petals equal.....E. setaceum var. capillus-naiadis.
    - 3a. Receptacular bracts glabrous; heads black; pistillate petals unequal.....E. intermedium.
    - 2a. Stem less than 3 inches long; leaves 8—10 inches long.....E. fluviatile.
- 1a. Plants of wet ground; stems less than a foot long; leaves linear or lanceolate.
  4. Anthers white or yellow; plants minute.....E. cinereum.
  - 4a. Anthers black or greenish.
    5. Receptacular bracts acuminate.
      6. Heads 1/3 inch in diameter; receptacular bracts hidden by the petals.....E. longiuspe.
      - 6a. Heads 1/2 inch wide; receptacular bracts not hidden by the petals.....E. robusto-brownianum.
    - 5a. Receptacular bracts not acuminate.
      7. Receptacular bracts (at least the outer ones) hidden by the projecting male parts.
        8. Heads 1/4 to 1/2 inch wide.
          9. Involucre black.....E. atratum.
          - 9a. Involucre stramineous.
            10. Leaves hairy.....E. subcaulescens.
            - 10a. Leaves glabrous.



11. Leaves linear, abruptly dilated at the base....  
E. ceylanicum.
- 11a. Leaves lanceolate.....E. subglaucum.
- 8a. Heads 1/2 to 1 inch wide; stems 3--4 inches long....  
E. atratum var. major.
- 7a. Receptacular bracts not hidden by the petals which are usually enclosed.
12. Heads with white or gray hairs; bracts dark.
13. Heads over 1/2 inch wide; plants often hairy.....  
E. brownianum.  
 [N.P. The hairy ones are now called E. nilagirense]
- 13a. Heads less than 1/2 inch wide.
14. Receptacle glabrous; involucre bracts horizontal; plants minute.
15. Scapes 1--2 inches long; heads 1/8 inch wide...  
E. trimeni.
- 15a. Scapes 2--4 inches long; heads 1/4 inch wide..  
E. truncatum.
- 14a. Receptacle villous.
16. Leaves not drying red.
17. Involucre bracts horizontal.
18. Leaves 1/3 inch wide at base; pistillate petals linear.....E. thwaitesii.
- 18a. Leaves 1/6 inch wide at base; pistillate petals oblanceolate.....E. ligulaefolium.
- 17a. Involucre bracts reflexed.
19. Staminate petals all well developed, one largest.
20. Heads 1/6 inch wide.....E. sollyanum.
- 20a. Heads 1/4 to 1/3 inch wide; transverse veins of leaves prominent..E. collinum.
- 19a. Staminate petals all very small; transverse veins of leaves obscure.E. walkeri.
- 16a. Leaves drying red.....E. quinqueangulare.
- 12a. Heads stramineous; bracts glabrous.
21. Florets trimerous; bracts acuminate.E. sexangulare.
- 21a. Florets dimerous; bracts acute.E. willdenovianum.

Miller (1950) lists the following fungi as attacking species of Eriocaulon in the United States: Cladochytrium replicatum Karling, in cells of old leaves, a leaf-rot (New York), Endophlyctis texana Karling, in cells of old leaves (Texas), Tolyposporium eriocauli Clint., a seed smut (Connecticut, Massachusetts, and New Hampshire), and Ustilago eriocauli (Mass.) Clint., a seed smut (Connecticut, Massachusetts, and New Hampshire). He says of the genus as a whole "Rushlike perennial herbs in shallow water or bogs throughout the Eastern and Central States and southward; sometimes used in bog gardens." The first, third, and fourth of the fungi probably are attackers of E. pellucidum Michx. since it is the only species of the genus in the states

mentioned in any abundance. In Texas there are six taxa represented.

The Partch 69-42, distributed as an Eriocaulon sp., is actually Syngonanthus pittieri Moldenke.

#### ERIOCAULON ABYSSINICUM Hochst.

Additional synonymy: Eriocaulon minimum Ruhl. apud N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 258, in syn. 1901 [not E. minimum Lam., 1791]. Eriocaulon sexangulare A. Rich. apud N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 258, in syn. 1901.

Additional bibliography: Durand & Schinz, Consp. Fl. Afr. 5: 502 & 503. 1894; N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 233, 234, & 257--258. 1901; Anon., Biol. Abstr. 56 (1): B.A.S.I. C. S.88. 1973; Moldenke, Biol. Abstr. 56: 75. 1973; Moldenke, Phytologia 26: 456 (1973) and 28: 456 & 457. 1974; Hocking, Excerpt. Bot. A.23: 293. 1974.

Brown (1902) cites Schimper 1944 and Quartin-Dillon s.n. from Ethiopia and asserts that the species occurs "Also in South Africa". He describes it as inhabiting "inundated places" and "on the mountain plains". Lely found it growing in running water on rocks, flowering and fruiting in October, and describes it as "a small sedge...4 inches" tall. It is, of course, not a sedge.

Additional citations: NIGERIA: Northern: Lely P.786 (E-1755950).

#### ERIOCAULON ACHITON Körn.

Additional & emended bibliography: Fyson, Journ. Indian Bot. 2: 202--204. 1921; Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Venkataredd, Bull. Bot. Surv. India 12: 220. 1970; Moldenke, Phytologia 24: 339--340. 1972; Sharma, Nucleus 15: Append. 10. 1972.

Additional illustrations: Fyson, Journ. Indian Bot. 2: 203. 1921.

Venkataredd (1970) reports this species as "occasional", flowering in August and September, and cites his no. 99102. Sharma (1972) reports a chromosome count of 30.

Additional citations: BANGLADESH: W. Griffith 5576 (Pd). THAILAND: Larsen, Larsen, Nielsen, & Santisuk 32341 (Ac).

#### ERIOCAULON ADAMESII Meikle

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111 & 203. 1949; Moldenke, Phytologia 26: 456. 1973.

#### ERIOCAULON AEQUINOCTIALE Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 63 & 203. 1949; Moldenke, Phytologia 24: 340. 1972.

#### ERIOCAULON AFRICANUM Hochst.

Additional bibliography: Durand & Schinz, Consp. Fl. Afr. 5:

502. 1894; Friedrich-Holzhammer & Roessler in Merxmüller, Prodr. Fl. Südw. Afr. 15, 159: 2. 1967; Moldenke, Phytologia 24: 340. 1972.

**ERIOCAULON AFZELIANUM** Wikstr.

Additional bibliography: Durand & Schinz, Consp. Fl. Afr. 5: 502. 1894; N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 236 & 250—251. 1901; Moldenke, Phytologia 26: 456. 1973.

Brown (1901) cites only Afzelius s.n. and Scott-Elliott 4339 from Sierra Leone and Barter 1019 from Northern Nigeria.

**ERIOCAULON ALPESTRE** Hook. f. & Thoms.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Phytologia 25: 247. 1973.

Material of this species has been misidentified and distributed in some herbaria as E. quinquangulare L.

Additional citations: INDIA: Assam: Hooker & Thomson s.n. [Mont. Khasia 5—6000 ped.] (Pd). State undetermined: Collector undetermined s.n. [Narainhetty, 22d Oct. 1802] (Pd).

**ERIOCAULON ALTOGIBBOSUM** Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 203. 1949; Moldenke, Phytologia 24: 341. 1972.

**ERIOCAULOM AMBOENSE** Schinz

Additional & emended bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 232 & 258—259. 1901; Friedrich-Holzhammer & Roessler in Merxmüller, Prodr. Fl. Südw. Afr. 15, 159: [1]—2. 1967; Moldenke, Phytologia 24: 341. 1972.

Friedrich-Holzhammer & Roessler (1967) cite for this species only the type collection, Schinz 859, from Uashitenga and Giess & Leippert 7608 and Merxmüller & Giess 2079b and 2134 from Namibia. Brown (1901) cites only the original collection, Schinz 859, from Namibia. He has modified the original description of the species and notes that "I do not find that the bracts are lacerate as stated in the original description, and it is only the outermost or involucre bracts that are sometimes obtuse; both in the type specimen which Prof. Schinz has kindly allowed me to examine and in the example at Kew they are as described above. I find only 2 sepals present in the female flowers, but the male flowers seem to be very variable in the number of their parts, some having 2 sepals, 3 petals, and 4 stamens, others 2 sepals, 3 petals and 6 stamens, whilst a few have 3 sepals, 3 petals and 6 stamens."

**ERIOCAULON ANDONGENSE** Welw.

Additional bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 233 & 247—248. 1901; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 203. 1949; Moldenke, Phytologia 24: 341. 1972.

Brown (1901) cites Welwitsch 2442, 2443, & 2443b from wet places by cataracts and "spongy rocky places by the springs on the gigantic rocks" and "spongy places on the higher rocks" in Angola, at altitudes of 2400 to 3800 feet. He comments that "This is very similar to E. Buchananii, Ruhland, but the heads are not so globose, being more or less flattened at the base, and the sepals of the female flowers have a rather long acutely acuminate point, whilst in E. Buchananii the point of the sepals is very short and never very acute."

ERIOCAULON ANGUSTIFOLIUM Körn.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 203. 1949; Moldenke, Phytologia 25: 121 (1973) and 26: 30. 1973.

ERIOCAULON ANNAMENSE H. Lecomte

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 203. 1949; Moldenke, Phytologia 25: 247. 1973.

ERIOCAULON ANNUUM Milne-Redhead

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117, 119, & 203. 1949; Moldenke, Phytologia 24: 341. 1972.

ERIOCAULON ANTUNESII Engl. & Ruhl.

Additional bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 235 & 242--243. 1901; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 203. 1949; Moldenke, Phytologia 24: 341-342. 1972.

Brown (1901) cites only the original collection, Antunes 139, from Hufla, Angola.

ERIOCAULON APICULATUM H. Lecomte

Additional bibliography: Perrier de la Bâthie, Cat. Pl. Madag. 21. 1934; Moldenke, Phytologia 24: 342. 1972.

Perrier de la Bâthie (1934) says that this plant grows in wet places along the shores of the Simiane River in Madagascar.

ERIOCAULON AQUATICUM (J. Hill) Druce

Emended synonymy: Eriocaulon septangulare L. ex Mart., Selbst. Pflanzenfam. 11. 1833.

Additional & emended bibliography: Wikstr., K. Svensk. Vet. Acad. Handl. Stockh., ser. 2, 1: 73 & 75. 1820; Wikstr., Trenne Nya Art. Örtsl. Erioc. [repr.] [7] & 9. 1821; Mart., Erioc. Selbst. Pflanzenfam. 11, 22, 38, & 58, pl. 2 (II), fig. 1-6. 1833; Kirby, Brit. Flow. Pl. 147. 1906; M. A. Johnstone, Fl. Ecology 65-66 & 159. 1928; Rydb., Fl. Prairies & Plains, pr. 1, 198 & 940, fig. 107. 1932; R. McVaugh, N. Y. State Mus. Bull. 360A: 93. 1958; Beug, Leitfaden Pollenbest. 1: vi, 59, & 60, pl. 8, fig. 7--9, text fig. 17a & b. 1961; Rydb., Fl. Prairies & Plains, pr. 2, 1: 198,

fig. 107 (1971) and pr. 2, 2: 940. 1971; I. K. & L. F. Ferguson & Halliday, *Watsonia* 9: 59. 1972; Sharma, *Nucleus* 15: Append. 10. 1972; Thorne, *Quart. Rev. Biol.* 47: 370. 1972; Van den Berghen, *Nat. Belg.* 53 (4): 157--169. 1972; Birks, *Past & Pres. Veg. Skye* 40, 87, 152, 184, 213, & 218. 1973; M. D. S., *Biol. Abstr.* 56: 1848. 1973; Ross-Craig, *Drawings Brit. Pl.* 31: pl. 46. 1973; Moldenke, *Phytologia* 26: 456 (1973) and 28: 456 & 460. 1974.

Additional illustrations: Mart., *Erioc. Selbst. Pflanzenfam.* pl. 2 (II), fig. 1--6. 1833; Beug, *Leitfaden Pollenbest.* 1: 59, text fig. 17 a & b, & pl. 8, fig. 7--9. 1961; Ross-Craig, *Drawings Brit. Pl.* 31: pl. 46. 1973.

Birks (1973) states that this species has as its principal habitat the *Magnocaricion elatae* ecologic association on the Isle of Skye as it does the *Eriocauleto-Lobelietum* of Blanquet & Tüxen (1952) and the *Eriocaulatum septangularis* of Schoof - Van Pelt & Westhoff (1969) within the alliance *Littorellium* in Ireland. He claims that no fossil *Eriocaulon* pollen has yet been identified on Skye. Johnstone (1928) avers that it occurs in some morainic ponds on the moor of Rannoch, Isle of Skye, "the only other British station for which is in the west of Ireland".... "In western Ireland and in the Hebrides there exist a few species whose nearest other stations are in North America. The list includes only these -- the blue-eyed grass (*Iridaceae*), pipewort, two other water plants and an orchid....puzzling....One theory explains them by means of a long-lost continent, which bridged the Atlantic between Ireland and America." In more recent years Wegener's "Floating Continent" theory is becoming more popular in explaining situations such as this.

Sharma (1972) reports the chromosome counts of 60 and 64.

Additional citations: MOUNTED CLIPPINGS: Kunth, *Enum. Pl.* 3: 540. 1841 (W).

#### ERIOCAULON AQUATILE Körn.

Additional bibliography: Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 76 & 203. 1949; Moldenke, *Phytologia* 24: 342. 1972.

#### ERIOCAULON ARGENTINUM Castell.

Additional bibliography: Moldenke, *Phytologia* 26: 179--180, 458, & 460. 1973.

Krapovickas and his associates found this plant growing "en pantano, al borde de una isleta de selva", flowering in December, and distributed it as *E. crassiscapum* Bong.

#### ERIOCAULON ARISTATUM H. Hess

Additional & emended bibliography: N. E. Br. in *Thiselt.*-Dyer, *Fl. Trop. Afr.* 8: 234 & 249. 1901; Friedrich-Holzhammer & Roessler in *Merxmüller, Prodr. Fl. Südw. Afr.* 15, 159: [1] & 2. 1967; Moldenke, *Phytologia* 24: 343. 1972.

Friedrich-Holzhammer & Roessler (1967) cite only *Dinter 7220* and *Volk 1806* from Namibia, noting that the type is from Angola.

Brown (1901) cites only Welwitsch 2444 from Huila, Angola.

ERIOCAULON ATABAPENSE Moldenke

Additional bibliography: Moldenke, Phytologia 24: 343. 1972.

Additional citations: VENEZUELA: Amazonas: Steyermark & Bunting 103228 (S).

ERIOCAULON ATRATUM Körn.

Synonymy: Eriocaulon stratum Gunawardena, Gen. & Sp. Pl. Zeyl. 206, sphalm. 1968.

Additional & emended bibliography: H. H. W. Pearson, Journ. Linn. Soc. Lond. Bot. 34: 357. 1899; Fyson, Journ. Indian Bot. 2: 310, pl. 26. 1921; Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Alston in Trimen, Handb. Fl. Ceylon 6: 303. 1931; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 130 & 203. 1949; Abeywickrama, Ceylon Journ. Sci. Biol. 2: 140. 1959; Gunawardena, Gen. & Sp. Pl. Zeyl. 206. 1968; Moldenke, Phytologia 26: 180 (1973) and 28: 456 & 457, 1974.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 26. 1921.

Thwaites (1864) cites Thwaites C. P. 61 for this species.

Pearson (1899) refers to it as common above 5000 feet altitude in Sri Lanka, citing numbers 60 (from 6200 feet, with straw-colored involucre bracts), 71 (the bracts brown with black edges), and 63 (from 8000 feet). He states that "in the type they [the involucre bractlets] are 'glossy-black'", concluding that "These [the numbers cited above] appear to be forms of E. atratum". The Van Beusekoms describe the plants as having light-green leaves and grayish-white flowers, while Grierson says "flower-stems 10—20 cm. tall, heads 4—5 mm. diameter, hemispheric, bracts blackish, flowers white".

The species has been collected in muddy places along paths and in shady places among moist rocks at streamsides, "locally abundant", at 1200—4500 m. altitude, flowering in March and August. The Thwaites C. P. 61, referred to above, is actually a mixture with E. ceylanicum Körn. and E. subglaucum Ruhl. In my experience many of Thwaites C[eylon] P[plants] numbers are mixtures of several taxa. This has led to serious misconceptions of species' characters in the past.

Additional citations: SRI LANKA: Collector undetermined s.n. [Maskeliya, March 1885] (Pd), s.n. [Adam's Peak, 6.iii.99] (Pd); Grierson 1043 (Pd); Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28271a (W), 28280 (W); G. M. Silva s.n. [Adam's Peak, 15/5/1906] (Pd); J. M. Silva s.n. [29.IV.26] (Pd); Sumithraarachchi DBS.114 (Z); Thwaites C.P. 61 [Gardner O.C.932], in part (Pd); Van Beusekom & Van Beusekom 1543 (Pd).

ERIOCAULON ATRATUM var. MAJOR Thwaites

Additional synonymy: Eriocaulon caulescens Hook., in herb. [not E. caulescens Kunth, 1971, nor Poir., 1813, nor Salzm., 1959, nor

Willd., 1841].

Additional bibliography: H. H. W. Pearson, Journ. Linn. Soc. Lond. Bot. 34: 357. 1899; Wangerin in Just, Bot. Jahresber. 51 (1): 169 & 170 [135 & 136]. 1929; Alston in Trimen, Handb. Fl. Ceylon 6: 303 & 305. 1931; Fedde in Just, Bot. Jahresber. 51 (2): 296. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 130 & 203. 1949; Abeywickrama, Ceylon Journ. Sci. Biol. 2: 140. 1959; Gunawardena, Gen. & Sp. Pl. Zeyl. 206. 1968; Moldenke, Phytologia 25: 238, 239, & 248 (1973) and 28: 456. 1974.

Gunawardena (1968) reminds us that E. philippo-coburgi, a synonym of E. atratum var. major, was named in honor of the Prince of Saxe-Coburg-Gotha.

The type of E. atratum var. major was collected by George Henry Kendrick Thwaites (C.P. 131) and is deposited in the Peradeniya herbarium. It is described by him as "Parce caulescens. Folia vaginis valde dilatatis. Sepala exteriora multum latiora quam in E. cristato, cui alioquin haec species simillima est".

Pearson (1899) cites his no. 77 from the Ceylonese patana grasslands at 8000 feet altitude. Recent collectors have found the plant in swampy patana grasslands, especially by streams, and in the transition zone between wet patana and forest, at 1500—2300 meters altitude, flowering in January and March, the flowers described as "white". Jayasuriya & Sumithraarachchi report it as "common on sandy-rocky island in river"

Material has been misidentified and distributed in some herbaria as E. longicuspe Hook. f.

Additional citations: SRI LANKA: Alston 945 (Pd); Amaratunga 1547 (Pd); Fyson s.n. [1927-8] (Pd); Hoogland 11503 (Pd); Jayasuriya & Sumithraarachchi 1567 (Ld); F. Lewis s.n. [Kunadiyaparama, Xmas 1917] (Pd); A. M. Silva s.n. [21/4/06] (Pd, Pd); Thwaites C.P. 131 (Pd—type), 940 (Pd).

#### ERIOCAULON ATRUM Nakai

Additional & emended bibliography: Satake, Journ. Jap. Bot. 46: 110 & 111 [13 & 15]. 1971; Moldenke, Phytologia 25: 248. 1973.

#### ERIOCAULON AUSTRALASICUM (F. Muell.) Körn.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153 & 203. 1949; Moldenke, Phytologia 24: 344. 1972.

#### ERIOCAULON AUSTRALE R. Br.

Additional bibliography: Moldenke, Phytologia 25: 232 & 248. 1973.

Durrington found this plant growing in sandy soil at the edge of swampy sedgeland with Todea barbata, flowering and fruiting in February.

Additional citations: AUSTRALIA: Queensland: Durrington AQ. 0009162 (N).

ERIOCAULON BARBA-CAPRAE Fyson

Additional & emended bibliography: Fyson, Journ. Indian Bot. 2: 197, pl. 4. 1921; Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 203. 1949; Moldenke, Phytologia 24: 345. 1972.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 4. 1921.

ERIOCAULON BARBEYANUM Ruhl.

Additional bibliography: Alston in Trimen, Handb. Fl. Ceylon 6: 304. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 203. 1949; Moldenke, Phytologia 24: 345. 1972.

Alston (1931) asserts that, in his opinion, this taxon may be conspecific with E. fluviatile Trimen.

ERIOCAULON BAURI N. E. Br.

Additional bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 250. 1901; Moldenke, Phytologia 25: 248. 1973.

ERIOCAULON BEAUVERDI Moldenke

Additional synonymy: Eriocaulon beauverdi (Beauverd) Moldenke ex Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1156. 1970.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 203. 1949; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1156 & Ind. 12. 1972; Moldenke, Phytologia 24: 346 (1972) and 28: 456. 1974.

ERIOCAULON BIFISTULOSUM Van Heurck & Muell.-Arg.

Additional & emended bibliography: Anon., Journ. Linn. Soc. Lond. Bot. 20: 522. 1884; J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 450. 1885; Durand & Schinz, Consp. Fl. Afr. 5: 502. 1894; N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 233, 234, & 239-241. 1901; Perrier de la Bâthie, Cat. Pl. Madag. 21. 1934; Moldenke, Phytologia 26: 457. 1973.

Brown (1901) cites only Barter 1021 from Northern Nigeria and Schweinfurth 2476 and 3-244 from "British East Africa" [Kenya?]. He comments that "After repeated dissection I am quite unable to find any definite character whereby to distinguish E. bifistulosum from E. Schweinfurthii; the heads of the latter are rather larger and darker than those of E. bifistulosum, and the peduncles appear to be stouter in the dried state, but thin transverse sections swollen out in water exhibit no difference in character or size. Such differences as are observable between them I believe to be due to vigour of growth and perhaps some difference in the food supply. The flowering bracts appear to be sometimes entirely glabrous, although usually those in the centre of the heads possess some hairs, which are easily overlooked. The hairs may be very deciduous, or the variation in pubescence and in the length of the peduncles may depend upon the depth of the water in which the plant grows submerged. Schweinfurth's 2476 appears to have



grown in shallow water, is less vigorous than the other specimens and the stem below the leaves is very short or almost wanting in the examples seen, but I cannot find any real structural difference. Sometimes the female flower are all in the central part of the head and the males outside, in other examples the female flowers are central and the males outside [sic]. E. bifistulosum and E. limosum were both founded upon Barter's 1021.

"It is not improbable that E. bifistulosum, together with E. fluitans, Baker, from Madagascar, should be united with the Brazilian E. melanocephalum, Kunth; there is, however, a slight difference in the structure of the peduncles and in the texture of the bracts and sepals. But they require further investigation from a larger series of specimens than is at my command before a correct decision can be made. From the Indian E. setaceum, Linn. (which it closely resembles in general appearance) the glabrous petals of E. bifistulosum readily distinguish it. The Australian plant named E. setaceum by Bentham is quite different in floral structure from all the species above mentioned."

Perrier de la Bâthie (1934) says that "Baker [Journ. Linn. Soc. 21: 450] fait de cette espèce [E. fluitans J. G. Baker] un synonyme de E. melanocephalum Kunth (E. aquaticum Sagot) de la Guyanne et du Brésil."

#### ERIOCAULON BLUMEI Körn.

Additional bibliography: Backer, Handb. Fl. Java 3: 5—6. 1924; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 144 & 204. 1949; Moldenke, Phytologia 24: 346. 1972.

Backer (1924) is of the opinion that E. macrophyllum Ruhl. is conspecific with E. blumei Körn.

#### ERIOCAULON BOMBAYANUM Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 204. 1949; Moldenke, Phytologia 24: 346. 1972.

#### ERIOCAULON BONGENSE Engl. & Ruhl.

Additional bibliography: N. E. Br. in Thiselt.—Dyer, Fl. Trop. Afr. 8: 233 & 246—247. 1901; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 111, 112, 118, & 204. 1949; Anon., Biol. Abstr. 56 (1): B.A.S.I.C. S.88. 1973; Moldenke, Biol. Abstr. 56: 75. 1973; Moldenke, Phytologia 26: 457. 1973; Hocking, Excerpt. Bot. A.23: 293. 1974.

Brown (1901) cites Barter 1019a from Northern Nigeria and Schweinfurth 2539 and 2722 from "British East Africa" [Kenya?].

#### ERIOCAULON BONI H. Lecomte

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 204. 1949; Moldenke, Phytologia 26: 18. 1973.

ERIOCAULON BRACHYPEPLON Körn.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 150 & 204. 1949; Moldenke, Phytologia 24: 347. 1972.

ERIOCAULON BREVIPEDUNCULATUM Merr.

Additional bibliography: Moldenke, Phytologia 24: 347 (1972), 25: 233 (1973), and 26: 18. 1973.

ERIOCAULON BREVISCAPUM Körn.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 204. 1949; Saxena, Bull. Bot. Surv. India 12: 62. 1970; Moldenke, Phytologia 26: 457 (1973) and 28: 444. 1974.

Saxena (1970) describes this plant as "Rare along riversides, partly in water", flowering in June, and cites Saxena 4614 from Madhya Pradesh, India.

ERIOCAULON BROMELIOIDEUM H. Lecomte

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 204. 1949; Moldenke, Phytologia 26: 18. 1973.

ERIOCAULON BROWNIANUM Mart.

Additional bibliography: Mart., Erioc. Selbst. Pflanzenfam. 29. 1833; H. H. W. Pearson, Journ. Linn. Soc. Lond. Bot. 34: 357. 1899; Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Alston in Trimen, Handb. Fl. Ceylon 6: 303 & 305. 1931; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Bond, Wild Fls. Ceylon Hills xiii, 232, & 233. 1953; Abeywickrama, Ceylon Journ. Sci. Biol. 2: 140. 1959; Gunawardena, Gen. & Sp. Pl. Zeyl. 206. 1968; Fonseka & Vinasithamby, Prov. List Local Names Flow. Pl. Ceylon 49. 1971; Hamzah, Toha, & Van Steenis, Mount. Fl. Java 48, pl. 19, fig. 2. 1972; Moldenke, Phytologia 26: 180 (1973) and 28: 447. 1974.

Additional illustrations: Bond, Wild Fls. Ceylon Hills 233. 1953; Hamzah, Toha, & Van Steenis, Mount. Fl. Java pl. 19, fig. 2 (in color). 1972.

Hamzah, Toha, & Van Steenis (1972) record this species from Java and Sumatra and describe it as growing to 1 meter in height, the leaves 10—80 cm. long, 0.5—2 cm. wide, the "stem" and leaves "fine hairy to a degree". They continue that it is found "In Java in swamps and on marshy banks of lakes (rantjas), only known from Mts Patuha.....Pèngalèngan.....& Dièng, where this conspicuous plant is common, even gregarious, often together with Sphagnum and associated with Machaerina, Xyris....., Juncus....., Rhynchospora....., and Scirpus....., at 1600—2300 m. Also in SE. Asia and in Atjeh, and in the mountain swamps and lakes of Sumatra's Westcoast."

Bond (1953) confuses this taxon with the similar but hairy E.

nilagirensis Steud., comparing it with the totally different E. truncatum Hamilt., noting that both occur in swampy ground up to the highest elevations in the Ceylonese hills and both are in flower "most of the year" — the former, he says, grows in large tufts of hairy grayish leaves and with flower-stems (scapes) up to 2 feet tall (the heads  $\frac{3}{4}$  inch wide), while the latter is a delicate plant with bright-green leaves and the scapes only 2—3 inches tall (the heads only  $\frac{1}{8}$  inch wide). My wife and I collected both species in the Horton Plains area of Sri Lanka earlier this year and found them unmistakably distinct.

Thwaites cites his C.P. 377 from 7000 feet altitude, while Pearson (1899) cites his no. 73 from 5600 feet and no. 76 from 7200 feet, commenting that the species is "common above 5000 feet". My wife and I found E. nilagirensis very common, but the true E. brownianum only in scattered localities.

Gunawardena (1968) reminds us that the species is named in honor of Robert Brown (1773—1858), who was naturalist on the "Investigator" to Australia in 1801, returning to England after 4 years to become Librarian of the Linnaean Society in London, discoverer of the cell nucleus and Brownian movement, author of many floras, such as those of Australia and Tasmania.

Finseka & Vinasithamby (1971) record the common name, "lady's hatpin", for this plant in Sri Lanka. Recent collectors have found it growing in moist patches of grass and in sunny hummocky swamp-meadows by ponds, at altitudes of 5600—7200 feet in Sri Lanka, flowering in February and August.

The C[eylon] P[lants] 378, cited below, is a mixture with E. brownianum var. latifolium Moldenke and with E. nilagirensis Steud. It was originally misidentified and distributed as E. wightianum Mart. The Amaratunga 418 and J. M. Silva s.n. [29.IV.26], distributed as E. brownianum are actually var. latifolium Moldenke, while Collector undetermined s.n. [Knuckles, 1881], s.n. [Dumbalagala Hill, Sept. 1888], & s.n. [Maha Eliya, 6.V.96], Comanor 980, Cramer 3149 & 3259, Mueller-Dombois 67070941, J. M. Silva s.n. [Horton Plain, 20/5/1911], N. D. Simpson 9427, and J. C. Willis s.n. [Horton Plains, 26/1/06] are E. nilagirensis Steud.

Additional citations: INDIA: Assam: Hooker & Thomson s.n. [Mont. Khasia, 3-5000 ped.] (Pd). State undetermined: Wight 2859 (Pd). BANGLADESH: N. Griffith 5574 (Pd). SRI LANKA: Amaratunga 1816 (Pd); Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28293 (Ac, Gz, Kh, Ld, Pd), 28962 (Ac, Gz, Kh, Ld, Pd, Z); Thwaites C.P. 377 (Pd, Pd), 378, in part (Pd, Pd); L. C. Wheeler 12374 (Pd, W-2716156).

#### ERIOCAULON BROWNIANUM var. LATIFOLIUM Moldenke

Additional bibliography: Moldenke, *Phytologia* 26: 180. 1973.

Recent collectors have encountered this plant in wet patana grassland to forest transition zone, in marshes and ditches, in "sunny, hummocky, swampy meadows by pond", and at the foot of

sandstone cliffs in a grassy swamp, at altitudes of 3100 to 7000 feet, flowering and fruiting in February, March, and June. Maxwell & Jayasuriya refer to it as a "common marsh plant", while Hepper describes it as a "tufted herb" with erect leaves and whitish inflorescences. It has been widely confused with typical E. brownianum Mart. and so distributed in herbaria. The type collection is a mixture with E. nilagirensis Steud.; in fact, a great many of the Thwaites C.P. numbers are mixtures of 2 or 3 species.

Additional citations: SRI LANKA: Amaratunga 418 (Pd); Hepper 4118 (Pd, W—2719994); Hoogland 11502 (Pd); Maxwell & Jayasuriya 869 (Pd); Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28297 (Ac, Gz, Kh, Ld, Pd, Z), 28306 (Pd); J. M. Silva s.n. [29. IV.26] (Pd); Thwaites C.P. 378, in part (Pd—isotype, Pd—isotype).

#### ERIOCAULON BUCHANANII Ruhl.

Emended synonymy: Eriocaulon buchanani Ruhl. ex N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 233. 1901.

Additional bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 233, 234, 247, & 248. 1901; Moldenke, Phytologia 26: 18. 1973.

Brown (1901) cites Buchanan 1168, Cameron 50, Kirk s.n., and Whyte s.n. from "British Central Africa" [Malawi?] and "Nyasa-land" [Malawi] at altitudes of 3800—4000 feet.

#### ERIOCAULON BUERGERIANUM Körn.

Additional & emended bibliography: Wangerin in Just, Bot. Jahresber. 49 (1): 160. 1927; Fedde in just, Bot. Jahresber. 49 (2): 423. 1932; Satake, Journ. Jap. Bot. 46: 373 [21]. 1971; Moldenke, Phytologia 24: 348. 1972.

Additional illustrations: Hayata, Icon. Pl. Formos. 10: fig. 29. 1921.

#### ERIOCAULON CABRALENSE Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 51 (1): 168 [134]. 1929; Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 60 [42]. 1932; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 204. 1949; Moldenke, Phytologia 26: 18. 1973.

Additional illustrations: Alv. Silv., Archiv. Mus. Nac. Rio Jan. 23: pl. 4. 1921.

#### ERIOCAULON CAESIUM Griseb.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 57 & 204. 1949; Moldenke, Phytologia 24: 348 (1972) and 25: 159. 1973.

#### ERIOCAULON CAPITULATUM Moldenke

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 30 & 204. 1949; Moldenke, Phytologia 24: 349. 1972.

ERIOCAULON CARAJENSE Moldenke, *Phytologia* 27: 63--65, fig. 1. 1973.

Bibliography: Moldenke, *Phytologia* 27: 63--65, fig. 1 (1973) and 28: 438. 1974.

Illustrations: Moldenke, *Phytologia* 27: 64, fig. 1. 1973.

Citations: BRAZIL: Pará: Cavalcante 125 [MG. 36706] (Z--type).

ERIOCAULON CAULIFERUM Mak.

Additional & emended bibliography: Satake, *Journ. Jap. Bot.* 46: 372 [20]. 1971; Moldenke, *Phytologia* 24: 349. 1972.

ERIOCAULON CEYLANICUM Körn.

Additional synonymy: Eriocaulon ceylanicum var. subacaulescens Wangerin in *Just, Bot. Jahresber.* 51 (1): 168 [134]. 1929

Additional bibliography: H. H. W. Pearson, *Journ. Linn. Soc. Lond. Bot.* 34: 357. 1899; Fedde & Schust. in *Just, Bot. Jahresber.* 53 (1): 60 [42]. 1928; Wangerin in *Just, Bot. Jahresber.* 51 (1): 168--169 [134--135]. 1929; Alston in *Trimen, Handb. Fl. Ceylon* 6: 303--305. 1931; Fedde in *Just, Bot. Jahresber.* 51 (2): 295. 1933; Abeywickrama, *Ceylon Journ. Sci. Biol.* 2: 140. 1959; Gunawardena, *Gen. & Sp. Pl. Zeyl.* 206 & 207. 1968; Fonseka & Vinasithamby, *Prov. List Local Names Flow. Pl. Ceylon* 49. 1971; Moldenke, *Phytologia* 26: 457 (1973) and 28: 456. 1974.

Recent collectors have found this plant growing in hummocky ground of depressions in wet black patana grasslands near meandering streams in poorly drained areas with *Ischaemum* as the chief cover, in meadows, and in moist seeps at the edge of deep woods, at altitudes of 6450 to 7200 feet, flowering in March, May, and June, and fruiting in June. Hoogland reports it as "common" in wet patanas, while Maxwell & Jayasuriya refer to it as "very common" in marshes. These latter collectors describe the flowers as white or (on the United States National Herbarium sheet, doubtless through some error in transcription) as "violet". Fonseka & Vinasithamby (1971) record the common name, "lady's hatpin".

Pearson (1899) cites his no. 70 from an altitude of 7200 feet on the Horton Plains -- an area where my wife and I also found it quite common earlier this year. Thwaites C.P. 61 is a mixture with E. atratum Körn. and E. subglaucum Ruhl.

The Eriocaulon cristatum var. Thwaites and E. cristatum var. bracteis floralibus denticulatis et longiuscule cuspidato-acuminatis Thwaites & Hook. f., previously cited as synonyms of E. ceylanicum, prove, instead, to belong in the synonymy of E. longiuscule Hook. f.

Additional citations: SRI LANKA: W. Ferguson 23 (Pd); Gould & Cooray 13787 (Pd), 13811 (Ca--1376072); Hoogland 11505 (Pd); Koyama & Herat 13640 (Pd); Maxwell & Jayasuriya 877 (Pd, W--2760939); Mueller-Dombois & Comanor 67070901 (Pd); A. M. Silva s.n. [Eliya lake, 9/4/06] (Pd); J. M. Silva s.n. [Horton Plain, 25/5/1911] (Pd, Pd); Thwaites C.P. 61, in part (Pd); J. C. Willis s.n. [Hor-

ton Plains, 4/5/06] (Pd).

ERIOCAULON CINEREIFLORUM R. Br.

Emended synonymy: Eriocaulon tenue Buch.-Ham. ex Wall., Numer. List 207, no. 6073, hyponym. 1832 [not E. tenue Humb. & Bonpl., 1817, nor H.B.K., 1816, nor Humboldt & Kunth, 1841, nor Kunth, 1826].

Additional & emended bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 259. 1901; Backer, Handb. Fl. Java 3: 7. 1924; Wangerin in Just, Bot. Jahresber. 49 (1): 160, 1927; Backer, Onkruidfl. 1: Handb. Suiker.-Cult. 7: 177, 178, & 844, pl. 186. 1928; Wangerin in Just, Bot. Jahresber. 51 (1): 169 [135]. 1929; Alston in Trimen, Handb. Fl. Ceylon 6: 303 & 304. 1931; Fedde in Just, Bot. Jahresber. 49 (2): 423 (1932) and 51 (2): 296. 1933; Alston, Kandy Fl. 76. 1938; Ikuse, Pollen Grains Jap. 46. 1956; Abeywickrama, Ceylon Journ. Sci. Biol. 2: 140. 1959; Nair, Pollen Grains West. Himal. Pl. [Asia Monogr. 5:] 35, 42, & 92, pl. 15, fig. 194. 1965; Nair, Essent. Palynol. [23], fig. 43. 1966; Deb, Sengupta, & Malick, Bull. Bot. Soc. Bengal 22: 210. 1968; Gunawardana, Gen. & Sp. Pl. Zeyl. 207. 1968; Quisumb., Act. Manil. A.4 (9): 38. 1969; Beard, West Austral. Pl., ed. 2, 25. 1970; Matthew, Bull. Bot. Surv. India 12: 91. 1970; Saxena, Bull. Bot. Surv. India 12: 62. 1970; Venkatarredd, Bull. Bot. Surv. India 12: 220. 1970; Thieret, Southw. Nat. 15: 391. 1971; Hocking, Excerpt. Bot. A.19: 364. 1972; Rouleau, Taxon Index Vol. 1-20 part 1: 139. 1972; Sharma, Nucleus 15: Append. 10. 1972; R. R. Stewart in Nasir & Ali, Fl. West Pakist. Annot. Cat. 36. 1972; C. D. K. Cook, Bull. Soc. Bot. Suisse 83: 55, 59, & 64. 1973; Moldenke, Phytologia 26: 457 & 462. 1973; R. R. Rao, Stud. Flow. Pl. Mysore Dist. 2: 874--875 [thesis]. 1973; H. R., Biol. Abstr. 57: 5680. 1974; Moldenke, Phytologia 28: 443 & 448. 1974.

Additional illustrations: Hayata, Icon. Pl. Formos. 10: fig. 27. 1921; Backer, Onkruidfl. 1: Handb. Suiker.-Cult. 7: pl. 186. 1928; Nair, Pollen Grains West. Himal. Pl. [Asia Monogr. 5:] pl. 15, fig. 194. 1965; Nair, Essent. Palynol. [23], fig. 43. 1966.

Recent collectors have found this plant growing in rice fields, in sandy mud at the edge of a tank reducing in area, and in very moist soil in general, flowering in February, August, September, and December. Hepper & Jayasuriya report it as "abundant all around many of the tanks [in Ceylon] as small green rosettes with short grayish inflorescence", Cramer says that he found it "common along borders of villu among short grasses" at sealevel, the "heads snow-white", and Amaratunga calls it a "bad weed in wet ricefields. Cooray refers to the inflorescence as "gray-white", which is also the description that my wife and I would give of it in our experience -- certainly we have never seen the heads "snow-white" [unless one is speaking of snow as it appears a few days after it has fallen on the streets of a big modern city! The scape (peduncle) is described as 4-angled.

Matthew (1970) describes this plant as "Tiny herbs occurring in gregarious masses in low-lying areas [with] copious masses

of flowers from December onwards", Saxena (1970) asserts that it is "Common in marshy places", flowering in September and October, and cites Saxena 10178 from Madhya Pradesh, India, while Venkatareddi (1970) found it to be "Frequent", flowering in October and November, citing his no. 101042. Deb and his associates cite Sengupta 1111 from Bhutan. Stewart (1972) reports it common in the ricefields of Pakistan at altitudes of 5000 to 7000 feet. Markos describes the California plants as "submerged except for upper part of the flowering stems [peduncles]."

Hepper & Jayasuriya refer to E. cinereum as a "small tufted herb, leaf-bases bright pink, inflorescence whitish", but the pink leaf-bases are not evident to me on their specimens (when dried). They found the plant growing in the "open" with sparse vegetation of Xyris and Utricularia. Hepper also encountered it on a "steep slope with wet flush and melastomaceous shrubs." Sharma (1972) reports the chromosome count as 32 and 18, the latter number for the E. sieboldianum form.

Cook (1973) reports on his Italian find of this species as follows: "It was found in shallow water in ricefields at Gréggio and at the Stazione di Riscicoltura. On 1 August 1957, H. Merxmüller and W. Wiedmann collected three immature and thus indeterminable rosettes of Eriocaulon near Gréggio (specimens deposited in the herbarium of the Botanische Staatssammlung München, M). In 1972 we revisited this area and found abundant mature E. cinereum. My determination has been checked by T. Koyama, D. Meikle and H. N. Moldenke. I have examined Merxmüller's material and there is no reason to doubt that it is also E. cinereum."

"E. cinereum is a common, pantropical weed of ricefields so it is not possible to give the origin of the Vercelli plants. However, it is possible to say that it has been in the Vercelli region for at least 15 years. Among the normal E. cinereum we collected two somewhat smaller dark-headed plants. Unfortunately, our material was inadequate for certain identification but the possibility exists of a second species being present." Growing with it were Murdannia blumei (Hassk.) Brenan, Rotala densiflora (Roth) Koehne, and R. ramosior (L.) Koehne, all also new records for Europe, and Elatine ambigua Wight and Sparganium erectum ssp. microcarpum (Neuman) Domin, both new for Italy. "Rice has been cultivated around Vercelli since at least 1475."

Material of E. cinereum has been misidentified and distributed in some herbaria as E. trimeni Hook. f. On the other hand, the Amaratunga 1759, distributed as E. cinereum, is actually E. truncatum Hamilt. and Santapau 13316 is a mixture with E. elenorae Fyson.

Additional citations: CALIFORNIA: Stanislaus Co.: Markos s.n. [Krause rice fields, Modesto, Sept. 18, 1947] (W-1976517). SIK-KIM: J. D. Hooker s.n. [1-5000 ped.] (Pd). PAKISTAN: Northwest Frontier: Nath 4035 (Kh). INDIA: Kerala: Santapau 13316, in part (E-1624131); Stocks, Law, &c. s.n. [Malabar & Concan] (Pd). Ut-

tar Pradesh: Collector undetermined 336 (Pd). State undetermined: T. Thomson s.n. [Ganget. Sup.] (Pd). BANGLADESH: Griffith 5565 (Pd); Hooker & Thomson s.n. [Chittagong, 0-1000 ped.] (Pd). SRI LANKA: Alston s.n. [8.IX.26] (Pd); Amaratunga 1149, in part (Pd), 1397 (Pd), 2208 (Pd); Collector undetermined s.n. [Dambulla Rock, 20 Dec. 1881] (Pd), s.n. [Pinnawala Balangoda, Sept. 1895] (Pd); Cooray 69121107R (Pd); Cramer 3160 (Pd); G. Gardner s.n. [Thwaites C.P. 795, Rambodda] (Pd); Hepper & Jayasuriya 4622 (W-2720107), 4628 (Pd); Moldenke & Moldenke 28194 (Ld); Moldenke, Moldenke, Jayasuriya, & Albert 28320 (Ld, Pd); Thwaites C.P. 795 [Mawanelle] (Pd). CHINA: Kwangtung: Sampson & Hance 9666 (Pd). AUSTRALIA: New South Wales: Leichhardt s.n. [Botary Bay] (Pd). JAPAN: Honshu: Hashimoto 1624 (Bl-158236).

ERIOCAULON CIPOENSE Alv. Silv.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 204. 1949; Moldenke, Phytologia 26: 20. 1973.

ERIOCAULON COLLETTII Hook. f.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 51 (1): 169 [135]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Phytologia 24: 351. 1972.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 3. 1921.

ERIOCAULON COLLINUM Hook. f.

Additional synonymy: Eriocaulon luzulaefolium Thwaites, in herb. [not E. luzulaefolium Mart., 1832].

Additional bibliography: H. H. W. Pearson, Journ. Linn. Soc. Lond. Bot. 34: 357. 1899; Wangerin in Just, Bot. Jahresber. 50 (1): 232. 1930; Alston in Trimen, Handb. Fl. Ceylon 6: 304 & 306. 1931; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Abeywickrama, Ceylon Journ. Sci. Bot. 2: 140. 1959; Gunawarden, Gen. & Sp. Pl. Zeyl. 207. 1968; Venkatareddi, Bull. Bot. Surv. India 12: 220. 1970; R. R. Rao, Stud. Flow. Pl. Mysore Dist. 2: 875 [thesis]. 1973; Moldenke, Phytologia 26: 180 (1973) and 28: 101 & 145. 1974.

Additional illustrations: Fyson, Journ. Indian Bot. 2: 139, fig. 3, & pl. 15. 1921.

Venkatareddi (1970) found this plant "Common in harvested fields", flowering from December to February, and cites his nos. 68360, 93186, 93372, & 95999.

Pearson (1899) cites his nos. 58 (from 3500 feet altitude) and 59 (from 5600 feet) and reports the species as "very common" at those altitudes in Sri Lanka. More recent collectors have encountered it in swamps in high forests, along muddy streams in patana grasslands, in swampy depressions along narrow streams in wet patana, along roadsides, and in marshland beside pools in "rough ground among mountains", growing among marsh grass. Max-



well & Jayasuriya report it as "common" in marshy areas. It is described as a tufted erect herb, with small gray or grayish inflorescences (heads), the individual flowers white. Sumithraarachchi describes the inflorescence heads as "black". It has been found growing at altitudes of from 3500 to 7100 feet, flowering in May and June (in addition to the months previously reported by me in this series of notes).

Material has been misidentified and distributed in some herbaria as E. luzulaefolium Mart. On the other hand, the Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28279, 28281, & 28292, distributed as E. collinum, are actually E. fluviatile Trimen.

Alston (1931) suggests that E. collinum may be conspecific with E. leucomeles Steud. If this is true, the latter name would have priority.

Additional citations: SRI LANKA: Alwis s.n. [Hakgala, April 1921] (Pd, Pd); Collector undetermined s.n. [Hakgala, 3.06] (Pd); Cooray 68051719 (W-2718774), 68051719R (Pd); Craig 6 (Pd); W. Ferguson s.n. [Abbotsford, Dimbula] (Pd); Hepper 4427 (W-2720002), 4442 (Pd, W-2720014); Koyama 14641 (W-2762878); Maxwell & Jayasuriya 876 (Pd, W-2760938); Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28271 (Ac, Gz, Kh, Id, Pd, Z), 28272 (Ac, Gz, Kh, Id, Pd), 28283 (Id, Pd), 28287 (Ac, Gz, Kh, Id, Pd), 28307 (Ac, Ca, Gz, Kh, Id, Pd); A. M. Silva s.n. [Ambewela, 19/5/06] (Pd), s.n. [path to Fort Macdonald, 25/4/06] (Pd), s.n. [Maturata, 18/5/06] (Pd); Sumithraarachchi IBS.113 (Z); Thwaites C.P. 792, in part (Pd), 796, in part (Pd, Pd).

ERIOCAULON COLLINUM var. NANUM Moldenke, Phytologia 28: 101. 1974.

Bibliography: Moldenke, Phytologia 28: 101 & 445. 1974.

This variety is based on J. M. Silva s.n., collected along a riverbank on the Horton Plains, Nuwara Eliya District, Central Province, Sri Lanka, on March 20, 1911, and two specimens are deposited in the herbarium of the Botanic Garden at Peradeniya. The plant is a dwarf herb, the flowering peduncles 2--12 cm. long, and the leaves very thin-membranous and tenuous, 1--4 cm. long, 0.5--1.5 mm. wide, glabrous, plainly fenestrate at the base, and the tips often subfiliform and weak. The variety is known only from the Horton Plains area and has also been collected in anthesis in February and April.

Citations: SRI LANKA: Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28284 (Id, Pd, Z); A. M. Silva s.n. [N' Eliya lake, 9/4/06] (Pd); J. M. Silva s.n. [March 20, 1911] (Pd--type, Pd--isotype); Thwaites C.P. 796, in part (Pd).

ERIOCAULON COMPRESSUM Lam.

Additional bibliography: Sharma, Nucleus 15: Append. 10. 1972; W. Stone, Pl. South. N. J., pr. 2, 323--325, pl. 64, fig. 2.

1973; Moldenke, Phytologia 26: 457--458 (1973) and 28: 428. 1974.

Additional illustrations: W. Stone, Pl. South. N. J., pr. 2,

pl. 64, fig. 2. 1973.

It is worth noting that the scapes are 8—10-angled on Nash 92 and 9- or 10-angled on Chickering s.n. [Hayward]. Sharma (1972) reports the chromosome count as 40.

Recent collectors have found the plant in anthesis as late as September in New Jersey.

Material has been misidentified and distributed in some herbaria as E. septangulare With. and as Lachnocaulon floridanum Small. On the other hand, the Herb. Chapman 555, Hollick s.n. [Aug. 15, '85], and Murrill 713, distributed as E. compressum, are actually E. decangulare L., O'Neill s.n. [Sept. 12, 1929] is E. decangulare var. latifolium Chapm., J. Davis s.n. [13-7-21], Hale s.n. [1840], A. A. Heller 181, W. Rhoades 323, Small & Heller 181, and Ulksi s.n. [Oct. 7, 1917] are E. decangulare f. parviceps Moldenke, and W. H. Brown 66 and Gleason, Smith, & Alexander 173 are E. pellucidum Michx. Martindale s.n. [Sep. 1877] is a mixture with E. decangulare L., while R. M. Harper 2146 is a mixture with E. lineare Small.

Additional citations: NEW JERSEY: Atlantic Co.: Killip 13295 (W-1435297); Van Sickle s.n. [Landisville, Aug. 10, 1890] (W-243226). Burlington Co.: Eames s.n. [VI-12-1894] (W-309077); Leonard & Leonard 6377 (W-2160300); Martindale s.n. [Sep. 1877] (W-784510); Moldenke & Moldenke 28597 (Ac, Gz, Kh, Ld). Cape May Co.: E. C. Leonard 2344 (W-2160186). County undetermined: Canby s.n. [Wet Pine Barrens, June 1862] (W-45270). NORTH CAROLINA: Columbus Co.: Godfrey & White 7104 (W-1811544). New Hanover Co.: Buell & Godfrey 3550 (W-1767089); Godfrey & White 7083 (W-1811530). County undetermined: McCarthy s.n. [April 1888] (W-45272, W-45277). SOUTH CAROLINA: Darlington Co.: J. B. Norton s.n. [March 18, 1921] (W-1115519), s.n. [Ap. 26, 1921] (W-1115520). Lexington Co.: Weatherby 6123 (W-1567545). GEORGIA: Bryan Co.: R. M. Harper 2170 (W-511188). Charlton Co.: F. Harper s.n. [Okefinokee Swamp, Jan. 11, 1917] (W-911035). Chatham Co.: Hotchkiss & Ehvall 3874 (W-2587246). Early Co.: Thorne 3294 (W-2005884). Montgomery Co.: R. M. Harper 2146, in part (W-511164). Sumter Co.: R. M. Harper 2219 (W-511236). Ware Co.: Tyron & Mc Vaughn 1481 (W-1811284). FLORIDA: Brevard Co.: Edw. Palmer 579 (W-45275). Calhoun Co.: Meigs s.n. [Mch. 1886] (W-937178). Clay Co.: Canby s.n. [Hibernia, March 1869] (W-45274). Duval Co.: Curtiss 3017 (W-937171), 4585 [March 13] (W-224480), 4584 [April 19] (W-224480); Fredholm 500 (W-214862); J. D. Smith 106 (W-937175), 378 (W-937174). Highlands Co.: Brass 14455 (W-2065019), 14611 (W-2065083), 14868 (W-2065214), 14880 (W-2065222). Lake Co.: Nash 92 (W-228001). Lee Co.: Francis 63 (W-1036541); J. P. Standley 15 (W-569473); P. C. Standley 12552 (W-896022), 12585 (W-896052), 12821 (W-896278), 14880 (W-897347). Levy Co.: G.

S. Miller 380 (W--1287747); O'Neill 732 (W--1241624). Okeechobee Co.: Brass 14582 (W--2065064). Osceola Co.: J. D. Smith s.n. [19 Mch. 1886] (W--937177). Palm Beach Co.: Small, DeWinkeler, & Rane 9815 (W--1738522). Polk Co.: Topping 2611 (W--1729088). Putnam Co.: Godfrey & Reinert 61111 (W--2385135). Saint Johns Co.: E. Doubleday s.n. [St. John's] (Pd); J. D. Smith 76 (W--937176), 422 (W--937173). Seminole Co.: Blanton 6512 (W--1485555); Garber s.n. [March 1876] (W--264068). Volusia Co.: H. C. Beardslee s.n. [March 1925] (W--1872347); A. S. Marsh 157 (W--1285355). Walton Co.: R. Kral 19844 (W--2470396). County undetermined: Chickering s.n. [Hayward] (W--155811); J. H. Simpson 548 [border of Everglades] (W--45276); Sperry 549 [Lake Lammonia] (W--1467112). ALABAMA: Mobile Co.: Mohr s.n. [March 1892] (W--784511). LOUISIANA: Calcasieu Par.: E. J. Palmer 7718 (W--1531692). Saint Tammany Par.: Canby, Sargent, & Trelease 256 (W--369743); R. Kral 16508 (W--2470426). TEXAS: Hardin Co.: E. J. Palmer 9563 (W--1531942).

ERIOCAULON COMPRESSUM var. HARPERI Moldenke

Additional bibliography: Moldenke, *Phytologia* 26: 181 & 457 (1973) and 28: 1974.

It is of interest to note that the scapes (peduncles) on Tracy s.n. [5/9/1898], cited below, are 8--10-angled.

Material of this variety has been misidentified and distributed in some herbaria under the names E. gnaphalodes Michx. and E. lineare Small.

Additional citations: FLORIDA: Bay Co.: R. Kral 19800 (W--2470370). Escambia Co.: R. Kral 19876 (W--2470391), 19880 (W--2470398). Franklin Co.: Biltmore Herb. 2296 (W--955021), 2296a (W--335121). Highlands Co.: Brass 14659 (W--2065106). Leon Co.: H. Kurz s.n. [May 16, 1926] (W--1287794). Osceola Co.: Mearns 33 (W--391120). Wakulla Co.: H. N. Moldenke 1123 (W--1581782). Walton Co.: R. Kral 19808 (W--2470400). Washington Co.: Small & Wherry 11695 (W--1738872). County undetermined: Herb. Chapman s.n. [Florida] (W--45271). ALABAMA: Baldwin Co.: Iltis, Crosswhite, & Kawano 21540 (Ca--1357905). Mobile Co.: Curtiss s.n. [1875] (W--45273); R. Kral 26526 (W--2470403). MISSISSIPPI: George Co.: R. Kral 19854 (W--2470397). Harrison Co.: Tracy 5032 (W--341109), s.n. [5/9/1898] (W--309073). LOUISIANA: Saint Tammany Par.: Langlois s.n. [1.V.1893] (W--1655533).

ERIOCAULON COMPTONII Rendle

Additional bibliography: Fedde & Schust. in Just, *Bot. Jahresber.* 53 (1): 60 [42]. 1923; Moldenke, *known Geogr. Distrib. Verbenac.*, [ed. 2], 151 & 204. 1949; Moldenke, *Phytologia* 24: 351--352. 1972.

ERIOCAULON CONCRETUM F. Muell.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153 & 204. 1949; Moldenke, Phytologia 24: 352. 1972.

ERIOCAULON CONICUM (Fyson) C. E. C. Fischer

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 204. 1949; Moldenke, Phytologia 24: 352. 1972.

ERIOCAULON CONIFERUM Herzog

Additional bibliography: Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 60 [42]. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 204. 1949; Moldenke, Phytologia 24: 352. 1972.

ERIOCAULON CRASSISCAPUM Bong.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76, 103, & 204. 1949; Angely, Fl. Anal. & Fito-geogr. Est. S. Paulo, ed. 1, 6: 1156 & Ind. 12. 1972; Moldenke, Phytologia 26: 458 & 460. 1973.

ERIOCAULON CRISTATUM Mart.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 51 (1): 169 [135]. 1929; Alston in Trimen, Handb. Fl. Ceylon 6: 304. 1931; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 124, 126, 132, 134, 135, 139, & 204. 1949; Moldenke, Phytologia 24: 349 & 352 (1972) and 26: 19. 1973.

Alston (1931) asserts that Trimen's record of this species from Sri Lanka, based, apparently, on his C.P. 789 collection (for which he proposed an innominate varietal status as "var. bracteis floralibus denticulatis et longiuscule cuspidato-acuminatis"), is a misidentification of E. ceylanicum Körn. C.P. 789 is cited by me as E. longicuspe Hook. f., the same disposition of it as is given also by Hooker.

Additional citations: INDIA: Assam: Hooker & Thomson s.n. [Mont. Khasia, 4-5000 ped.] (Pd); Native collector s.n. [Khasi hills] (Pd).

ERIOCAULON CRISTATUM var. MACKII Hook. f.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 204. 1949; Moldenke, Phytologia 24: 353. 1972.

ERIOCAULON CUBENSE Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 45 & 204. 1949; Moldenke, Phytologia 24: 353. 1972.

**ERIOCAULON CUSPIDATUM** Dalz.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 51 (1): 169 [135]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 295. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 204. 1949; Thaker, Sabnis, & Bedi, Bull. Bot. Surv. India 12: 125. 1970; Moldenke, Phytologia 26: 21. 1973.

Thaker and his associates (1970) record this species from Gujarat, India.

Additional citations: INDIA: Kerala: Stocks, Law, &c. s.n. [Malabar, Concan] (Pd).

**ERIOCAULON DALZELLII** Körn.

Additional bibliography: Durand & Schinz, Consp. Fl. Afr. 5: 503. 1894; Wangerin in Just, Bot. Jahresber. 51 (1): 169 [135]. 1929; Fedde in Just, Bot. Jahresber. 51 (2): 296. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 126, 130, & 204. 1949; Abeywickrama, Ceylon Journ. Sci. Biol. 2: 141. 1959; Moldenke, Phytologia 24: 353 (1972) and 28: 192, 442, & 444. 1974.

Gould & Cooray encountered this plant in marshy soil along a stream, at 2300 meters altitude, flowering in May. Durand & Schinz (1894) report it from Sierra Leone.

The W. Ferguson s.n. [Labugama, 1832], distributed as E. dalzellii, is actually E. fluviatile Trimen.

Additional citations: INDIA: Kerala: Stocks, Law, &c. s.n. [Malabar, Concan] (Pd). SRI LANKA: Gould & Cooray 13787 (Ca--1376098).

**ERIOCAULON DAMAZIANUM** Beauverd

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 204. 1949; Moldenke, Phytologia 24: 353. 1972.

**ERIOCAULON DECANGULARE** L.

Additional bibliography: Wikstr., K. Svensk. Vet. Acad. Handl. Stockh., ser. 2, 1: 74. 1820; Wikstr., Trenne Nya Art. Örtsl. Ericc. [7] (repr.). 1821; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 4--9, 11, 18, 22, & 204. 1949; Bullock, Taxon 8: 171. 1959; Hocking, Excerpt. Bot. A. 19: 43. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1156 & Ind. 12. 1972; C. A. Br., Wildfls. La. 11, 238, 240, & 243. 1972; Rouleau, Taxon Index Vols. 1-20 part 1: 139. 1972; Robichaud & Buell, Veg. N. J. 319 & 327. 1973; W. Stone, Pl. South. N. J., pr. 2, 323 & 325, pl. 28, fig. 2. 1973; Moldenke, Phytologia 26: 458 (1973) and 28: 427--430 & 456. 1974.

Additional illustrations: C. A. Br., Wildfls. La. 11 (in color). 1972; W. Stone, Pl. South. N. J., pr. 2, pl. 29, fig. 2. 1973.

Recent collectors have encountered this plant in pine-palmetto swamps.

The label on Lundell 11902 in the United States National Herbarium is inscribed "Perennial herb, corolla yellow, anthers or-

ange", so this is doubtless a case of transposed labels. A binary head is seen on the United States National Herbarium specimen of J. D. Smith 492. Common names for the species in Florida include "bachelor's button" and, among the Seminole Amerinds, "talakcyi: lf". Brown (1972) records "hard-heads" for it in Louisiana.

It is worthy of note that the scapes (peduncles) are 10-angled on Shreve & Jones 1300, 11-angled on A. S. Hitchcock 375, 10- or 11-angled on Hollick s.n. [Aug. 15, '85], 8--10-angled on Kearney 1558, 9--13-angled on Hyams s.n. [Bengaw, Sept. 1879], and 12--14-angled on Tracy 6417, all deposited in the United States National Herbarium at Washington.

Fernald & Long 14924 and Godfrey 5760 exhibit characters approaching those of *f. parviceps* Moldenke, while Biltmore Herb. 3867c, Curtiss 3016, Nash 847, Small & Heller 180, and P. C. Standley 18888 exhibit leaves which approach those of *var. latifolium* Chapm.

The following collections, cited herein under *f. parviceps*, were collected early in the season (mostly in May, June, or July) and are very immature. They may well represent very immature specimens of typical *E. decangulare* L.: Biltmore Herb. 3867b, Coville 202, Hotchkiss & Ekvall 3755, R. Kral 17208 & 17223, McCarthy s.n. [Julio 1885], E. J. Palmer 7981, Small & Heller 180, Thaxter s.n. [Cullhowee, June 15--July 15, 1887], and Tracy 7587. E. C. Leonard 2344, distributed as *E. decangulare*, is actually *E. compressum* Lam.; Martindale s.n. [Atsion, Sep. 1877] is a mixture with *E. compressum*; Ahles 54809, Holm s.n. [7.1888], and Thomas, Dorris, & Drane 13921 are *E. decangulare* *var. minor* Moldenke, while W. M. Canby s.n. [Pine barrens] is *E. pellucidum* Michx.

Additional citations: NEW JERSEY: Atlantic Co.: Standley & Killip 7567 (W--1115386). Burlington Co.: M. A. Chase 3552 (W--594231); Martindale s.n. [Atsion, Sep. 1877] (W--784510). Monmouth Co.: D. C. Eaton s.n. [1860] (W--2588805). Ocean Co.: Chickering s.n. [June 28, 1877] (W--937164); Drushel 8358 (W--1600939); Eggleston 4894 (W--586070); Hollick s.n. [Aug. 15, '85] (W--309076); Lyon s.n. [Aug. 15, 1902] (W--1101385); Mackenzie 3694 (W--648776). County undetermined: N. L. Britton s.n. [Pine Barrens, Aug. '79] (W--309073); W. M. Canby s.n. [Pine barrens] (W--45301); Eaton 15654 (Pd). MARYLAND: Wicomico: W. M. Canby 192 (W--937167); Shreve & Jones 1300 (W--608564). DISTRICT OF COLUMBIA: Holm s.n. [8.1900] (B1--253866). VIRGINIA: Norfolk Co.: Kearney 1558 (W--356248). Prince George Co.: Fernald, Long, & Smart 6790 (W--1682875). Sussex Co.: Fernald & Long 14924 (W--2003551). NORTH CAROLINA: Brunswick Co.: Drushel 10075 (W--1688975). Carteret Co.: Godfrey 5792 (W--1768165); McCarthy 5 (W--45308). Chowan Co.: Godfrey 5345 (W--1768032). Columbus Co.: Godfrey 6341 (W--1768438). Craven Co.: W. H. Brown 49 (W--512889);

Godfrey 4432 (W-1767483). Cumberland Co.: Godfrey 4550 (W-1767577). Onslow Co.: Godfrey 5760 (W-1768114). Pender Co.: Godfrey 4740 (W-1767704); Hyams s.n. [Bengaw, Sept. 1879] (W-152099). Rowan Co.: Small & Heller 180 (W-937162). Roanoke Island: Hotchkiss & Uhler 7225 (W-2422098). County undetermined: Small & Heller s.n. [North Carolina] (W-45264). SOUTH CAROLINA: Berkeley Co.: Godfrey & Tryon 603 (W-1837454). Darlington Co.: Norton s.n. [Cohen 69] (W-1070520). Georgetown Co.: Godfrey & Tryon 343 (W-1837243). Greenville Co.: J. D. Smith 16 (W-937163). Hampton Co.: Wilbur & Webster 2833 (W-2132026). Williamsburg Co.: Godfrey & Tryon 509 (W-1837383). GEORGIA: Ben Hill Co.: R. Kral 28773 (W-2673948). Brooks Co.: R. Kral 28685 (W-2673944). Calhoun Co.: R. Kral 28624 (W-2673946). Camden Co.: Drushel 10133 (W-1688980). Dodge Co.: R. Kral 28745 (W-2673945). Early Co.: R. Kral 27090 (W-2673947). Jeff Davis Co.: Shacklette 6919 (E1-201214). Laurens Co.: R. Kral 28723 (W-2673942). Screven Co.: R. Kral 24030 (W-2470322). Sapelo Island: Duncan 20365 (W-2262623). FLORIDA: Duval Co.: Curtiss 3016 (W-45269, W-937159), 5060 [June 20] (W-224479), 5060 [Aug. 6] (W-224479), 5690 [June 24] (W-280617), 5690 [Aug. 21] (W-280617). Franklin Co.: Biltmore Herb. 3867c (W-335192). Hendry Co.: Sturtevant 148 (W-2524700). Hernando Co.: Howard 12953 (W-2327934). Highlands Co.: Brass 15282 (W-2065465). Lake Co.: Nash 847 (W-228003, W-937165), 1722 (W-228082, W-937166). Lee Co.: A. S. Hitchcock 375 (W-387408); P. C. Standley 12866 (W-896323), 18888 (W-1028667), 18891 (W-1028670). Levy Co.: Kral & Kral 6920 (W-2308420). Manatee Co.: Perdue 1757 (W-2233087). Orange Co.: Murrill 713 (W-1928533). Washington Co.: E. S. Ford 3686 (W-2230909). Saint Vincent Island: McAtee 1828 (W-586169). County undetermined: Herb. Chapman 555 (W-937170); J. H. Simpson 396 [Trahus] (W-45266). ALABAMA: Baldwin Co.: Mohr s.n. [Oct. 7, 1894] (W-784513); Tracy 8043 (W-513697). Butler Co.: J. D. Smith 491 (W-937158), 492 (W-937157). Escambia Co.: R. Kral 32488 (W-2673953). Mobile Co.: Bush 71 (W-318393); Mohr s.n. [Aug. 1870] (W-784516). MISSISSIPPI: Covington Co.: Webster & Wilbur 3373 (W-2068092). Hancock Co.: Drushel 10094 (W-1688978). Harrison Co.: Demaree 30610 (W-2176872); Tracy 6417 (W-383776), s.n. [7/2/1895] (W-309079). Jackson Co.: Tracy 6417 (W-354205). Pearl River Co.: R. Kral 17331 (W-2470429). LOUISIANA: Calcasieu Par.: Allison 267 (W-514075). Saint Tammany Par.: Arsène 11030 (W-1031601), 11663 (W-1031602), 11786 (W-1033018), 12259 (W-1033053); Langlois s.n. [9.IX.1892] (W-1465968). TEXAS: Hardin Co.: Lundell & Lundell 11902 (W-2330383); Tharp s.n. [2-21-42] (W-1873641).

## ERIOCAULON DECANGULARE var. LATIFOLIUM Chapm.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 9, 11, & 204. 1949; Moldenke, Phytologia 24: 354 (1972) and 28: 428. 1974.

Material of this variety has been misidentified and distributed in some herbaria as E. compressum Lam. The Biltmore Herb. 3867c, Nash 847, Small & Heller 180, and P. C. Standley 18888, cited herein as typical E. decangulare L., have leaves rather wide for that taxon and may very possibly represent var. latifolium instead. They are from Franklin County, Florida, Lake County, Florida, Rowan County, North Carolina, and Lee County, Florida, respectively.

Additional citations: FLORIDA: Marion Co.: O'Neill s.n. [Sept. 12, 1929] (W-1488441). County undetermined: Herb. Chapman 553 [Florida] (W-937161), s.n. [Florida] (W-955018—isotype). ALABAMA: Baldwin Co.: Mohr & Sargent s.n. [Oct. 7, 1894] (W-784512). MISSISSIPPI: Harrison Co.: J. D. Smith 650 (W-937160).

## ERIOCAULON DECANGULARE var. MINOR Moldenke

Additional bibliography: Moldenke, Phytologia 26: 22 (1973) and 28: 427 & 429. 1974.

Recent collectors have found this plant growing in swamps and on boggy pond shores, flowering (in addition to the months previously reported) in June.

Additional citations: DISTRICT OF COLUMBIA: Holm s.n. [7.1888] (Bl--253279). NORTH CAROLINA: Lincoln Co.: Ahles 54809 (Bl--180702). LOUISIANA: Jackson Par.: Thomas, Dorris, & Drane 13921 (Bl--244325).

## ERIOCAULON DECANGULARE f. PARVICEPS Moldenke

Additional bibliography: Moldenke, Phytologia 26: 458 (1973) and 28: 427-430. 1974.

Recent collectors have found this plant growing in tufts on sandy peat of bogs in longleaf pine savannas, in sandy clay peat moist from borrow pit bogs, in sandy peat of pine flatwoods bogs, in wet sand and gravel openings in swamps, on Sphagnum hillocks in open white gravelly bogs, in grass-sedge bogs or savannas, on gravel in seepage bogs, in moist pinebarrens, boggy woods, coastal plain swamps, moist meadows, pinelands and wet open pinelands, white sandy swamps, open, sandy, acid, and mountain bogs, and savannas, at altitudes from near sealevel to 2500 feet. The flowering-heads are uniformly described as white or gray-white. The scapes are to 4 dm. tall on Cory 56611, 7-angled, with the sheath surpassing the leaves. Thaxter s.n. [Cullhowee, June 15--July 15, 1887] has its scapes 8--10-angled, Ward s.n. [Holmead Swamp, Oct. 3, 1880] has them 7--10-angled, Hyams s.n. (Burgaw, Aug. 1878] has them 10-angled, McCarthy s.n. [Julio 1885] 7- or 8-angled, and R. M. Harper 444 only 9-angled. On J. Reverchon 4359a the scapes are 6-angled and the plant is obviously in very young flower-bud condition (collected on May 9).



It should be noted here that the leaves are rather long and broad in J. Reverchon 2766 (collected on July 10), Tharp 4434b, and Hotchkiss & Ekvall 3755. One sheet of Hale s.n. [1840] has leaves of typical f. parviceps length and breadth, while the other sheet has them extra long and broad. One plant on the Ward s.n. [Holmead Swamp, Oct. 3, 1880] exhibits leaves typical for f. parviceps, while the other has them extra long and broad. McCarthy s.n. [julio 1885] consists of 3 typical f. parviceps plants as to leaf-size and -shape, and a fourth plant with much longer and wider leaves (this latter plant may be a juvenile specimen of typical E. decangulare L.). The Collector undesignated s.n. [1832], cited below, has leaves of typical f. parviceps length, but rather broader than is typical for the form.

Harper says of his no. 3996: "May be E. decangulare, but rather small, pretty far inland, and blooming rather late [Aug. 15] for that species". He found it growing among rocks below the highwater mark along the Little River, Cherokee County, Alabama, and adds the comment that "E. lineare was found in the same county in 1906 (see Bull. Torrey Club 33: 527) but that blooms still earlier."

Practically all the New Jersey specimens cited below have erect elongate leaves, all the Maryland specimens have short temuous leaves, almost all the District of Columbia collections have rather longish narrow leaves [except one plant of the Ward s.n. collection]. Most of the North Carolina specimens exhibit narrow rather short leaves [except as otherwise noted below] — the collections made in July and August appear to have mature heads and are probably correctly identified as f. parviceps, but those collected in June or even early July, if also exhibiting larger leaves, may very well prove to be immature examples of typical E. decangulare. Most of the Georgia collections have rather short narrow leaves as is typical of f. parviceps (e.g., Cronquist 5425, Earle 3123, R. M. Harper 4444, W. Rhoades 323). Maxon 6469 actually has leaves so tiny that they greatly resemble those of E. pellucidum Michx.! Wurdack & Wurdack 2542 is a voucher for anatomical material and the collectors note that the plant was "locally abundant". All the South Carolina specimens cited below show narrow somewhat elongate leaves.

The following collections, although cited below because of their small heads, are very immature and in view of the early time of collection may actually represent not-yet-fully-developed plants of typical E. decangulare L. whose flower-heads have not yet fully expanded: Biltmore Herb. 2867a [July] & 3867b [July], Coville 202 [June], R. Kral 17208 [May 29] & 17223 [May 29], E. J. Palmer 7981 [June 12], and Tracy 7587. The following have rather large leaves and may actually represent immature specimens of var. latifolium Chapm.: Hotchkiss & Ekvall 3755 [June], Small & Heller 180 [June 25-26, 1891], and Thaxter s.n. [Chillhowee, June 15--July 15, 1889].

On the other hand, the following collections, also cited below, are likewise only in flower-bud condition but seem rather definitely to be f. parviceps when the sum total of characters is considered: Godfrey 4483 [June], Pollard 484 [July], and P. C. Standley 11756 [June] -- House 2602 has slightly wider leaves but otherwise meets all the important characteristics of f. parviceps.

In summation: of the specimens cited below the following seem very definitely to represent f. parviceps and may be taken as truly representative: (1) collected in June: Cronquist 5425, Earle 3123, Godfrey 4483; (2) collected in July: Anect 90, Chickering s.n. [Manchester, July 19, 1873], Fogg 4602, Godfrey 4868, Godfrey & Tryon 927, House 2602, R. Kral 20651 & 20970, McAttee 989, McCarthy s.n. [Julio 1885] in part, Pollard 484, and Tharp 2380, 44345, 44346, & 44348a; (3) collected in August: N. L. Britton s.n. [Manchester, Aug. 28, 1879], M. A. Chase 6854, Fogg 4655, Godfrey 5821 & 6166, R. M. Harper 444 & 3996, Killip 6470, Leggett s.n. [Quaker Bridge, Aug. 8th 1864], E. C. Leonard 706, W. Rhoades 323, Steele s.n. [Tecoma Park, Aug. 12, 1896], and Van Eseltine 190; (4) collected in September: E. J. Alexander s.n. [Forked River, Sept. 18, 1932], Coville s.n. [Holmead's Swamp, Sept. 29, 1889], Maxon 6469, Olds s.n. [Old Powder Mill Swamp, Sept. 1898], and Standley & Bollman 10258; and (5) collected in October: Dewey 158 and Ward s.n. [Holmead Swamp, Oct. 3, 1880] in part.

As some indication of how different from the typical E. decangulare L. is the aspect of this plant when fully matured, one should note the large number of the collections cited below which were originally identified by the collectors in the field as E. compressum Lam., E. gnaphalodes Michx., E. lineare Small, E. septangulare With., and E. texense Körn. Material of this form has also been misidentified and distributed in some herbaria under the curious designations "Eriocaulon decangularis L." and "Lachnocaulon anceps (Walt.) Moray".

The following collections were previously misidentified and cited by me as E. decangulare before more intensive study revealed the presence of subspecific taxa: E. J. Alexander s.n. [Forked River, Sept. 18, 1932], Biltmore Herb. 3867a & 3867d, Braun s.n. [July 26, 1938], N. L. Britton s.n. [Manchester, Aug. 28, 1879], Collector undetermined s.n. [1832], Cronquist 5425, Earle 3123, Godfrey 5821 & 6166, Godfrey & Tryon 927, R. M. Harper 444 & 3996, A. A. Heller 181 [August 21, 1890], R. Kral 17223, 20651, & 20970, Leggett s.n. [Quaker Bridge, Aug. 8th, 1864], Reverchon 2766, W. Rhoades 323, Small & Heller 180 [June 25--26, 1891], Tharp 44345, 44346, 44348a, & s.n. [Sealy, 6/28/42], and E. H. Walker 4160.

Additional citations: NEW JERSEY: Burlington Co.: Fogg 4602

(W--1630698), 4655 (W--1630699); Leggett s.n. [Quaker Bridge, Aug. 8th 1864] (N); Wurdack & Wurdack 2542 (W--2537034). OCEAN CO.: E. J. Alexander s.n. [Forked River, Sept. 18, 1932] (N); N. L. Britton s.n. [Manchester, Aug. 28, 1879] (N); Chickering s.n. [Manchester, July 19, 1873] (W--2588395). MARYLAND: Harford Co.: Ulksi s.n. [Oct. 7, 1917] (W--1439973). Prince Georges Co.: M. A. Chase 6854 (W--642607); Killip 6470 (W--1088649); E. C. Leonard 706 (W--2153188); McAtee 989 (W--642738); Olds s.n. [Old Powder Mill Swamp, Sept. 1898] (W--338855); P. C. Standley 11756 (W--895338); E. H. Walker 4160 (N). DISTRICT OF COLUMBIA: Coville s.n. [Holmead's Swamp, Sept. 29, 1889] (W--45309); Dewey 158 (W--283491); Maxon 6469 (W--1184060); Pollard 484 (W--293635, W--307440); Steele s.n. [Tacoma Park, Aug. 12, 1896] (W--363620); Van Seltine 190 (W--642234); Vasey s.n. [Holmead Swamp, 1881] (W--9786); Ward s.n. [Holmead Swamp, Oct. 3, 1880] (W--152100), s.n. [1884] (W--242442). NORTH CAROLINA: Brunswick Co.: Godfrey 4868 (W--1767804). Buncombe Co.: Biltmore Herb. 3867a (N, W--331152), 3867d (N, W--335490); Standley & Bollman 10258 (W--689079). Catawba Co.: Small & Heller 180 [June 25--26, 1891] (N, W--45265). Columbus Co.: Braun s.n. [July 26, 1938] (W--2666390). Dare Co.: Hotchkiss & Ekvall 3755 (W--2422097). Jackson Co.: Thaxter s.n. [Cullhowee, June 15--July 15, 1887] (W--415881). New Hanover Co.: Biltmore Herb. 3867b (W--331151); Coville 202 (W--45307). Onslow Co.: Godfrey 4483 (W--1767530), 5821 (N, W--1768188). Pender Co.: Hyams s.n. [Burgaw, Aug. 1878] (W--152097). Rowan Co.: A. A. Heller 181 [August 21, 1890] (C); Small & Heller 181 [Aug. 14, 1891] (W--937172). Sampson Co.: Godfrey 6166 (W--1768297). County undetermined: McCarthy s.n. [Julio 1885] (W--152098, W--243906). SOUTH CAROLINA: Anderson Co.: J. Davis s.n. [13-7-21] (W--1089021). Clarendon Co.: Godfrey & Tryon 927 (N, W--1837695). Lancaster Co.: House 2602 (W--514154). GEORGIA: Columbia Co.: Collector undetermined s.n. [1832] (C). Douglas Co.: Cronquist 5425 (N, W--1928744). Lee Co.: Earle 3123 (N). Sumter Co.: R. M. Harper 4444 (N, W--384446). Wilcox Co.: W. Rhoades 323 (N). FLORIDA: Manatee Co.: Tracy 7587 (W--442233). ALABAMA: Cherokee Co.: R. M. Harper 3996 (N, W--2175560). LOUISIANA: Allen Par.: R. Kral 20970 (N, W--2470409). Beauregard Par.: R. Kral 17208 (W--2470427). Nat-chitoches Par.: E. J. Palmer 7981 (W--1531711). Rapides Par.: Hale s.n. [1840] (W--784514, W--784515). Saint Tammany Par.: Anect 90 (W--1087047). Vernon Par.: R. Kral 17223 (N, W--2470396), 20651 (N, W--2470395). TEXAS: Austin Co.: Tharp 44346 (N), 44348a (N), s.n. [Sealy, 6/28/42] (N, W--1873642), s.n. [Bog near Sealy, 6/28/42] (Bl--50060). Hardin Co.: Tharp, Gimbrede, & Yang 51-1449 (Bl--91419); Tharp & Tyson s.n. [6/27/52] (Bl--91875). Henderson Co.: Tharp 2880 (W--1203408). Jasper

Co.: Cory 56611 (W-2007913). Robertson Co.: F. A. Barkley 13540 (W-1870419). Smith Co.: J. Reverchon 2766 (N, W-440232, W-500957), 4359a (W-501327). Tyler Co.: Tharp 44345 (N). Waller Co.: E. Hall 675 (W-45267). NICARAGUA: Cabo Gracias a Dios: Bunting & Licht 438 (N).

ERIOCAULON DECEMFLOSUM Maxim.

Additional & emended bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 130, 133, 134, & 204. 1949; Satake, Journ. Jap. Bot. 46: 372-373 [20-21]. 1971; Moldenke, Phytologia 24: 354. 1972.

ERIOCAULON DECEMFLOSUM f. ABERANS Satake

Additional & emended bibliography: Satake, Journ. Jap. Bot. 46: 373 [21]. 1971; Moldenke, Phytologia 24: 354. 1972.

Emended illustrations: Satake, Journ. Jap. Bot. 46: 373 [21]. 1971.

ERIOCAULON DECIPIENS N. E. Br.

Additional synonymy: Eriocaulon sonderianum Rendle ex N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 245, in syn. 1901 [not E. sonderianum Körn., 1856].

Additional & emended bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 235 & 245. 1901; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119, 120, & 204. 1949; Moldenke, Phytologia 24: 354-355 (1972) and 28: 457. 1974.

Brown (1901) cites Whyte 115 from Malawi and comments: "This plant is so exceedingly like E. sonderianum, Koernicke, in external appearance as to have been mistaken for it, but it distinctly differs in the following particulars: -- The flowering-bracts are much longer, broader, without the fuscous spot on each side of the less pronounced keel, and are less rigid and more membranous; the sepals of the male flowers are larger, much more membranous, not keeled, and are fuscous quite to the apex, whilst in E. sonderianum the apical part of the sepals of the male flowers is white with a whitish mid-line running half-way down the keel. Other differences may, perhaps, be found in the female flowers when known. From E. Dregei, Hochst., it differs in its very acute leaves, and much shorter cilia on the sepals, &c."

ERIOCAULON DENSUM Mart.

Additional bibliography: Moldenke, Phytologia 24: 355 (1972) and 25: 229 & 239. 1973.

ERIOCAULON DEPAUPERATUM Merr.

Additional bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 141 & 204. 1949; Moldenke, Phytologia 24: 355. 1972.

[to be continued]